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AND

COAL

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THE meeting of the American Institute of Mining Engineers takes place at Pittsburg, Pa., February 16th.

EMPLOYERS in any part of the world who require the services of superintendents, mining or civil engineers, metallurgists, chemists, mine or furnace foremen, or other assistance of this character, can have their wants advertised in the ENGINEERING AND MINING JOURNAL without charge.

THE spring meeting of the American Society of Mechanical Engineers will be held in Chicago, Ill., beginning Tuesday, May 25th next. Papers to be read at this meeting should be in the hands of the Secretary before March 22d. This requirement is made in order that time may be given for those members who intend to discuss a paper to receive an advance copy of it for the preparation of their remarks, and, by shortening the time consumed in presenting papers, to allow time for the discussions. The secretary would like the *titles* of all papers at once.

HAVING in mind the fact that American tools, locomotives, bridges, stamp-mills, furnaces, etc., are deservedly preferred everywhere to English, and are purchased in many English colonies, one of our London exchanges says:

"John Bull begins to see a dangerous rival in his cousin Jonathan, and he regards with grave apprehension the marked manner in which Australia is coquetting with his American competitors."

Of course, our British contemporary tries to convince the Australians that they are all wrong in their preferences, that the English articles are, "unquestionably, superior to American," only the benighted Australians are too stupid to recognize it, and their stupidity constantly increases as measured by the preference they give to American manufactures. The English paper says:

"The time must come when Australian buyers will discover their error and acknowledge a preference for the soundness of British manufactures."

Yea, it has come and gone. They did prefer the English manufactures until they had tested the American, and the result is, indeed, as our complaining contemporary says:

"We find railroad plant, machinery, and tools of American make threatening to drum us out of the Australian markets."

This testimony should open the eyes of the buyers in other colonies who have not yet used the American goods.

DRYING THE AIR FOR BLAST-FURNACES.

The mere suggestion of pumping water into a blast-furnace would strike the average blast-furnace manager as "a crazy idea," and yet, perhaps, few of them have considered how much they actually do pump into their furnaces as moisture in the air.

Every furnace manager is familiar with the effect of a moist condition of the atmosphere in lowering the grade of his iron, and none need be reminded of the greater amount of fuel necessary to heat the blast, containing half a ton of water an hour, to the temperature of from 1300 to 1500 degrees Fahr., as required in the best modern blast-furnace practice.

Is it practicable to dry the air economically, before blowing it into the furnace, and what is the cheapest and best means of accomplishing this result?

These are questions a favorable solution of which would effect a measurable economy in producing iron, and would enrich the fortunate inventor.

It it said that in England a simple method for accomplishing the drying of the blast has been applied with satisfactory results, and no doubt our American ingenuity will also, now that its attention has been directed to the subject, devise an economical means of attaining this end. Will some of our readers give their ideas on this subject, through the columns of the ENGINEERING AND MINING JOURNAL?

THE PROPOSED PACIFIC RAILROAD GRAB.

Our excellent contemporary, the *Railroad Gazette*, exposes "the true inwardness" of the Hoar bill, by which, under a specious form, it is proposed to get the country practically to give more than $100,000,000 additional to the Pacific roads.

It might have been suspected that any proposition to change the obligation of these roads to the government meant only a swindle on the people in some form, and the *Railroad Gazette* deserves credit for exposing it. This is what it says:

"The Hoar bill, providing for the payment of the indebtedness of the Pacific railroads to the government, has been introduced in the Senate again this year, but modified in some particulars.

"The bill provides that the 'present value' of the debts (which become due in 1897, '96, and '98) October 1st next shall be ascertained on the basis of 3 per cent interest, uncompounded, which will be about 72½ per cent of the debt at that time, and amount, for all the companies, to about $112,000,000, as nearly as we can ascertain. This debt is to be paid in 160 equal half-yearly installments, interest at 3 per cent, uncompounded, being added for the average date of payment—that is, for 40 years—which will make the gross sum 120 per cent greater than the principal, namely, $246,000,000, and the half-yearly payment $1,537,500. Now the interest alone on the 'present' value of the debt, at 3 per cent, would be $3,360,000 per year, or $285,000 more than it is proposed to have the companies pay to retire the principal as well as the interest. The arrangement, therefore, is equivalent to giving the Pacific railroads the principal of what they owe to the government, on condition that they pay interest on it for 80 years at a rate (2⅜ per cent) lower than the government even is able to borrow, and at least two fifths less than the rate which these companies have to pay capitalists for the use of money. It is simply a roundabout means of giving these railroads another subsidy exactly like the first one—that is, the use of interest money without interest for a long term of years. For instance, the installment of $3,075,000 due in 1966 under the Hoar bill, could be provided for by investing $292,125 in a 3 per cent sinking fund this year."

COAL-DUST IN THE MARDY COLLIERY EXPLOSION.

The influence of coal-dust in colliery explosions appears to have been terribly illustrated in the explosion at the Mardy colliery, in South Wales, incorrectly referred to in our issue of December 26th, 1885, as "the Ferndale explosion." The accounts of the explosion that we have received in the *Western Mail* state that the mine was examined after the explosion by a committee of well-known mining engineers and superintendents, and it was found almost entirely free from gas.

"In the drift and near the double parting, where 36 dead bodies were found, they saw traces that the blast had exhausted itself there. But every thing was perfectly safe there at the time of examination. This was found to have been the center of the area of the explosion. But now comes the most extraordinary discovery made by the examiners. They found all over the colliery—roadways, headings, stalls, etc.—a layer of exceedingly fine brown soot, lying everywhere and upon every thing. It was as fine as flour and perfectly free from grit, proving that, as long as the substance of the coal-dust continued to hold out, it was so much food for the fire. It is the opinion of these engineers that, on the fatal day of the explosion at Mardy, one of the 'comets,' in which paraffine is burned openly at the bottom of shafts, fell accidentally, and that the fired oil quickly set the coal-dust on fire; that it burned like lightning."

This confirms the German experiments on the explosiveness of coal-dust, and is an example that should attract the attention of engineers everywhere.

Mr. GALLOWAY was probably the first English engineer to direct attention to the explosiveness of coal-dust, and its *rôle* in colliery explosions.

Eighty lives were lost in the Mardy explosion.

RAIL-JOINTS AND STEEL RAILS.

Mr. C. P. SANDBERG, the distinguished railway inspecting engineer, has recently contributed to the Institution of Civil Engineers an interesting paper on the above subject, the text of which is the news "received from America, that fish-plates break frequently, and that steel rails wear badly." Concerning the first of these items, which was pretty thoroughly discussed last year in the *Railroad Gazette*, Mr. SANDBERG offers, so far as we can see, no new explanation and no new remedy. He gives a clear account of the successive steps in the improvement of rail-joints abroad, showing how the flattening of the rail-ends has been counteracted by the use of stiffer fish-plates, chiefly of the "angle" type. But he also gives drawings (obtained through Mr. JOHN FRITZ, of Bethlehem) of the angle fish-plates "on some of the best lines in America," and observes that "they are a great deal stronger than those used in Sweden, or, at any rate, there is more metal in them. The difference," he adds, "between the American and the Swedish angle fish-plate is also that the former have slots, while the latter have holes for the spikes. But this is no reason why they should break by thousands on American roads." Indeed, he can only remark that the many explanations hitherto suggested "have not been altogether satisfactory," and intimate that perhaps we must come (and Europe too, should "the same sad experience" show itself in course of time there) to bridge-plates, Fisher's joint, or something else, not now known. Our friend Mr. CLARK FISHER gets, incidentally, what newspaper men would call a good notice for his invention, which the author says he looked upon as hopeful, as far back as 1873. Another incidental allusion of Mr. SANDBERG's renews an old suggestion of HOLLEY'S, which has not yet lost its force, namely, that good ballasting and a thorough maintenance of the road-bed have much to do with both the stability of joints and the wear and breakage of rails.

Under the second head, Mr. SANDBERG considers the reports of the short life of recent American steel rails, and concludes that "any railway that took proper care of its interest in choosing a good maker, and having a good specification with careful, honest inspection, could have good rails, whether they were made in America or in Europe." But he praises the good sense of the American railway president who ordered, a year or so ago, 10,000 tons of English steel rails, at a cost of $100,000 more than he would have paid in the United States, because he had had excellent experience of the rails obtained from the same English maker "about eighteen years ago." We remember that this famous transaction was suspected at the time to be actuated by less direct and simple motives; and as Mr. SANDBERG states it, we can not but find it a little difficult to believe. After the lapse of eighteen years, it would be too much even for a railway president to expect the same quality of rails from works in which the materials, the plant, and the men must have suffered total change during that period. However, we do not doubt that good rails were or will be furnished under that order, especially as Mr. SANDBERG remarks that he is the inspector, and will take care that "the honor of the English makers is maintained."

Under the head of chemical composition, Mr. SANDBERG repeats his former criticism of Dr. DUDLEY'S famous formula, and declares that,

"as rail-steel in one district may vary very much in chemical composition from that in another, and still good rails may be made in both, it would be unpractical to stipulate in the specification for only one definite composition. Nor is it wise to specify the amount of carbon only, because this should depend upon the amount of hardeners present. All that can be said is, that rail-steel with carbon as the principal hardener and with a minimum of phosphorus is preferable, particularly in cold countries, and that the inspecting engineer should compare mechanical tests with the chemical composition of his rail, and try to find what hardness can safely be used in each individual case. For there is no doubt that the rail of medium hardness wears better than that of soft or mild steel, however useful the latter may be for ship-plates and for constructive purposes."

The author thinks that the introduction of the "barbarous" test of a ton falling 30 feet led to the manufacture of rail-steel soft enough to stand that test, but consequently too soft to give maximum wear. He pronounces the best wearing rail to be one with say 0·5 per cent carbon, other hardness being at a minimum; and he gives for ordinary use in testing a table, in which the falling test is regulated according to the weight of the rail, the distance of bearings being in all cases given as 3 feet, and the test ranging from a half-ton falling 6 feet for a 30-pound rail, to a ton falling 15 feet for a 65 pound rail, and a ton falling 33 feet for a 100-pound rail. He argues strongly for heavier rail-sections, and says, "It seems fair to suggest that the bad results in the wear of the steel rails in America, now complained of, may be caused by the use of rails which are too light in proportion to the rolling-stock, the speed, and the traffic." Heavier and harder rails are, to put it most briefly, what he recommends, though with due caution and respect to local circumstances. Steel sleepers he approves, and thinks they will certainly be adopted in England; but these, too, in his opinion, have been made too light upon the continent.

Mr. SANDBERG mentions the undoubted fact that steel rails and sleepers rust much faster than those made of iron. Why this should be, is, he says, not quite clear, and suggests that it may be because "iron rails and sleepers are rolled at a higher heat than steel, and with floating slag round the pile as a silicate of iron, which is not readily affected by water and atmospheric air; while the steel ingot is rolled at a lower temperature, free from slag, and its pure metallic surface is exposed to the action of air and moisture when put in stock before being laid on the line."

Having had some occasion to look into this matter, we beg to suggest to Mr. SANDBERG, on the strength of laboratory experiments conducted for us by good chemists, that the presence of manganese in Bessemer steel is the cause of its greater susceptibility to oxidation. We have found the same peculiarity in other cast-steel and ingot iron; and we are inclined to think it is not connected with the manipulation so much as the chemical constitution. The experiments to which we refer did not indicate that the manganese, as such, oxidized before the iron or steel, but rather that the alloy containing manganese was, as a whole, more easily oxidized than a metal relatively free from that element. This view, we believe, has also been suggested by European chemists, though we have not personally seen their discussions of the subject.

CORRESPONDENCE.

[We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.]

The Rensselaer Polytechnic.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I am glad to see you taking an interest in the welfare of the pioneer engineering college of the country, the Rensselaer Polytechnic Institute. It has done a noble work in the past, and, with energetic management, can continue to hold a commanding position as an educator in all practical science. It is undoubtedly true that the tendency of the management has been to err on the side of conservatism. While it may be questioned whether old methods of *teaching* have been improved upon by our modern tinkers—in other words, whether *memory* is not stimulated at the expense of logical method and systematic development of the mind—it can not be gainsaid that the rapid discoveries in all departments of science are constantly tending to make old courses of study in a measure *obsolete*. It is, therefore, absolutely essential that an institution that would keep abreast of the times should give opportunity for study in new avenues of thought, if it would make its students most ready for usefulness in their day and generation.

The groundwork of its courses will not be essentially changed from that of the past; but this having been supplied, every student should have the opportunity of being rightly directed in the preliminary investigation of some special branch that he may select as his probable life-study. The Troy Polytechnic has already provided several of these; but it should provide more, and it should make provision for the adequate support of all; as an institution should never be dependent upon the income from students' fees for its entire support.

The time has gone by when professors who are competent are willing to sacrifice themselves for the good of others without reasonable compensation; and practical men, who alone are of value in such courses of study, can not be expected to yield a certain income from their professional practice for a smaller one as professors in an institution.

Can not the citizens of Troy be aroused to see their duty and their true interest in this important matter?

As to the question recently under discussion by the trustees, it would seem as though there could be but one opinion as to the propriety of a single head to the Institute. Dual control has never worked well, in the history of nations, institutions, or individuals. ALUMNUS No. 1.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: It is high time some one should endeavor to rattle up those dry bones that are fossilizing as trustees of the Rensselaer Polytechnic Institute. You are perfectly right. The grand old Institute has fallen far behind its old position in the race, and I for one hesitate a good deal before recommending students to go there; for I know, what these

fossil trustees apparently do not know, the advantages other and rival institutions now give their students.

No doubt, as you say, the professors of the Institute do all that they possibly can; but a school of engineering that provides only such facilities for instruction in the higher practical departments of the profession, and which can not secure instruction by the best practical experience in professional specialties, will soon come to be classed simply as a training-school for higher institutions.

Whether the trustees recognize it or not, it is nevertheless true, and is generally recognized by the alumni in actual practice, that, unless a great change be effected in the management and efficiency of the Institute—a change that will require a much larger income than the Institute possesses or can collect from students—it will rapidly decline to the position of a second or third class engineering school, of which we have so many in the country.

It is scarcely to be expected that Troy, which has so long drawn a large income from the Institute, and, "with a few generous exceptions," has given nothing to it, will do any thing to save it now. There are, however, more liberal communities than Troy, and perhaps some of them might use the glorious record of the Institute to build up an engineering school worthy of the Rensselaer Polytechnic Institute's ancient renown. Unless something is done, and done soon, even the now flagging interest of the alumni will die out, and when we are asked, as many of us are, "I want to study engineering; where shall I go—to Troy, or to Cornell, or Columbia, or Boston, or Worcester, or etc.?" we shall have to say, "The Rensselaer Polytechnic Institute was formerly far the best engineering school in America; but it has been starved to death in Troy, and it seems to have fallen into a rut from which it can not extricate itself. It can not give the means for acquiring the highest and most important part of an engineering education; for it has neither the instructors nor the appliances, and is satisfied to remain without them. Some of the younger schools are better provided, and you can have the same theoretical training supplemented by special courses by Messrs. —— and —— and ——, who are recognized in the profession as among our best practical engineers. Though my sympathies are all with the old Institute at Troy, as an employer of engineers I think you had better go to one of the other schools." BRIDGES.

The Miner's Inch.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I have been making inquiries as to the correct standard for the "miner's inch" as a measure for water, and find that, as all sorts of measures may be used, the choice would mostly fall on the side of intelligence and against ignorance, for considerably more water can be obtained under one standard than another. Please tell me (and I am sure many others would be interested) through your columns the different standards you may know of and the legal aspect of the matter.

As far as I can find, neither the general mining law nor the laws of Montana mention any standard; although California, I understand, has some standard.

I give below some of the standards I hear of for the miner's inch:

1. One inch square opening in a two-inch plank, the level of the water being six (6) inches above the opening (center, top, or bottom of said opening?).
2. 93 pounds of water per minute = miner's inch (1″).
3. 196¼ pounds of water per minute = 2 miner's inches (2″).
4. 8 gallons of water per minute = miner's inch (1″).
5. The depth of overflow in inches multiplied by the width of same in inches equals the number of miner's inches; for example, an overflow 20 inches wide and 2 inches deep gives 40 miner's inches.

I am satisfied that there are many more; but which one ought to be used and has custom sanctioned any particular standard?

If you think this a matter of any general interest to your readers, you will reply at your convenience. Truly yours, C. F. PEARIS.

GREGORY, MONT., Jan. 21.

[The following extract from Bowie's Treatise on Hydraulic Mining (just out) will answer our correspondent.—EDITOR ENGINEERING AND MINING JOURNAL.

"The miner's inch of water is a quantity which varies in almost every district in California; no one gauge has been uniformly adopted, nor has any established pressure been agreed on under which the water shall be measured. In some counties, there are 10, 11, or 12-hour inches, and in others there is a 24-hour inch. The apertures through which the water is measured are generally rectangular, but vary greatly in width and length, being from one inch to twelve inches wide, and from a few inches to several feet long. The discharges are through 1-inch, 1½-inch, 2-inch, and 3-inch planks, with square or with square and chamfered edges, combined or not, as the case may be. The bottoms of the openings are sometimes flush with the bottoms of the boxes, sometimes raised above them. The head may denote the distance above the center of the aperture, or again that above the top, and varies from 4½ inches to 12 inches above the center of the aperture.

"The Smartsville inch is calculated from a discharge through a four-inch orifice with a seven-inch board top; that is to say, the head is seven inches above the opening, or nine inches above the center. The bottom of the aperture is on a level with the bottom of the box, and the board which regulates the pressure is a plank one inch thick and seven inches deep. Thus, an opening two hundred and fifty inches long and four inches wide, with a pressure of seven inches above the top of the orifice, will discharge 1000 Smartsville miner's inches. Each square inch of the opening will discharge 1·76 cubic feet per minute, which approximates the discharge per inch of a two-inch orifice through a three-inch plank with a head of nine inches above the center of the opening, the said discharge being 1·78 cubic feet per minute. The Smartsville miner's inch will discharge 2534·40 cubic feet in twenty-four hours, though in that district the inch is reckoned for eleven hours only.

"*Other Inches.*—The miner's inch of the Park Canal and Mining Company, in El Dorado County, discharges 1·39 cubic feet of water per minute. The inch of the South Yuba Canal Company is computed from a discharge through a two-inch aperture, over a one and one half inch plank, with a head of six inches above the center of the orifice.

"At the North Bloomfield, Milton, and La Grange mines, the inch has been calculated from a discharge through an opening fifty inches long and two inches wide, through a three-inch plank (outer inch chamfered), with the water seven inches above the center of the opening."

Experiments at Columbia Hill, 2900 feet above sea-level, gave the following results: One miner's inch discharged 1·57 cubic feet per minute, or 2260·8 cubic feet per twenty-four hours.

At La Grange, 216 feet above tide, one miner's inch discharged 1·50 cubic feet per minute, or 2159 cubic feet per twenty-four hours.

OFFICIAL STATEMENTS AND REPORTS.

Silver King Mining Company, of Arizona.

The manager's report for 1885 states that the affairs of the company have moved along quietly during 1885, the production of silver, reduced to a gold basis, being $743,200.44, from which eight dividends of $25,000 each have been paid the stockholders, aggregating in gold two hundred thousand dollars, still leaving a good strong balance on hand in the treasury, with no indebtedness to provide for.

The additions to the plant at mine and mills were completed in due time, and the results are fully up to expectations.

It has been another dry year, and the water supply therefore lessened from natural causes; to remedy which, two wells were sunk three miles from Pinal, and the water from them piped to the reduction-works, this additional supply being sufficient for all present requirements.

The treating of the heavy quartz ore by amalgamation has continued profitably by the new mill No. 2.

Mill No. 1 continues, as heretofore, concentrating the porphyry ore at a profit.

The work in the mine has been the extraction of ore from the 700, 600, and 500-foot levels, and in keeping all the underground workings, including the shaft, in good condition.

The giving way of the old timbers, referred to last year, has continued, but is now more satisfactory, and no bad results are looked for from that cause.

No new work has been done below the 700-foot level during the past year, and previous to again doing so it will be well to have a new shaft, fitted with pump, to take care of any water we may have to contend with. This new shaft, properly connected with the old one, will also assist greatly in the ventilation of the entire underground workings of the property. Some action should be taken on this subject, authorizing an expenditure sufficient for this purpose.

During the year, there have been no expenditures other than those required in the regular routine work of the extraction of the ore and its proper reduction. The present situation, combined with the favorable outlook for the future, is a matter of congratulation to all interested, the only thing to be regretted being the low and declining price of silver.

The financial statement shows the following:

RECEIPTS.

Balance on hand January 1st	$33,008.87
Sales of bullion during year	92,550.53
Sales of concentrations during year	650,649.91
	$776,209.31

DISBURSEMENTS

Assaying	$564.00
Expenses	10,122.20
Freight	19,439.14
Merchandise, machinery, and supplies	37,374 28
Dividends No. 46 to No. 53	200,000.00
Superintendent's drafts account of mill and mill expense	402,568.95
Balance on hand December 31st	106,140.74
	$776,209.31

From the superintendent's report, we learn that 27,160 tons of ore were mined and delivered to the reduction-works. This is stated to have come from 331,965 cubic feet. The mine does not supply enough waste to fill in worked-out ground. Of rock, 15,220 tons were quarried on the surface and sent into the mine for filling. About 5680 gallons of water have been raised daily by tanks. Of wood, 1528 cords, at $10 a cord, were used during the year.

THE MILL AND MILLING.

The Mill.—The mill is designed for treating our baryto-quartzose ore unfit for concentration by the method of dry crushing, roast-chlorinating, and amalgamation. As an auxiliary to the former method of lixiviation, three large rotary roasting-furnaces, seventy inches diameter by sixteen feet long inside the lining, were erected in the mill, and these furnaces are now made use of again in connection with the present method of treatment, as is also a 12-inch by 24-inch Meyer cut-off engine. A bucket elevator and cage hoist are used to handle the battery and roasted pulp. An additional steel boiler 54 inches by 16 feet was obtained to furnish power, and recently another steel boiler of the same dimensions was set in position, replacing the old original boiler. The old lixiviating-tanks, fifteen in number, were moved to the highest point on the mill premises, set up compactly on framing, two tiers high, and a building 25 feet by 50 feet erected over them. They are now used as receiving-tanks for our water supply, carrying a ready reserve of 25,000 gallons.

The tools and appliances of the old machine-shop being crowded out of place in the construction of the new mill, a new and much needed shop, 25 feet by 50 feet, was erected adjoining the tank-house, giving us much better facilities for our repair work, and an adequate storeroom for machine supplies. The former, a well-constructed adobe blacksmith-shop, has been converted into a refinery and provided with two retorting and two melting-furnaces, and with the general arrangements and appliances offers every convenience for the casting and handling of silver bars.

An eight-inch deep well pump was placed over the twelve-inch bored well in the mill early in the year, furnishing us with a good supply of cleaner water for boiler purposes.

The old concentrating mill of twenty stamps stands without change, and is now designated as mill No. 1, while the new mill is known as mill No. 2.

The total amount of ore treated at mill No. 1 during the year was 21,853·04

tons, which has yielded 68 shipments of concentrations, averaging about 11½ tons each, and aggregating 770·3525 tons. The ore shipped was about 3·52 per cent of that crushed. The average assay value of the ore, as by daily assays, was $56·79, and that of the tailings similarly obtained was $6·75. Of the silver contents of the concentrations, 48·17 per cent was in the form of native silver, 51·83 per cent being combined in the various argentiferous sulphides.

As this company's lease of the Windsor 5-stamp amalgamating mill did not expire until the end of June, the mill was operated both regularly and experimentally by us during the first six months of the year. During that time, there were treated 1008·315 tons of both the barytic and the porphyry ore, 280·20 tons of old tailings, and 69·485 tons of second-class concentrations, the porphyry ore and the latter two classes being treated experimentally. The tailings were taken from various parts of a pile of several thousand tons, and were treated by different methods of raw amalgamation, being unable to stand the expense of a roast chlorination. The second-class concentrations were partially headings produced on an Embrey table by treatment of blanket concentrates, and partially concentrations of the tailings as they run from mill No. 1, by means of an apparatus devised by Mr. F. H. Blake. We had some refractory material to deal with, but in the end obtained satisfactory results. The entire amount treated in the mill was 1358 tons, of an average assay value of $48.19. The average assay value of all the tailings was, under the circumstances, unavoidably high, $16.26, but would have been much less with better appliances, as we have reason to know. With such material as required roasting, the average amount of salt used was 2¼ per cent, and the average chlorination 50·86 per cent, the silver being partially in native form. The consumption of quicksilver was 1·69 pounds per ton of ore treated, and the product was twenty-two bars of bullion of 852·68 average fineness.

On August 17th, the stamps dropped in mill No. 2, and the mill has been kept as continuously working as possible since that time. Occasional interruptions have occurred from unforeseen causes, and a few alterations were early made to insure the better work of the mill, the most notable being in changing the stack of the roaster-furnaces, the original position providing an inadequate draught. The design of the mill was based on nearly a year's work at the Windsor mill, and it was considered that four pans would be sufficient for the capacity of the battery; but with due allowances for improved mechanism, the crushing capacity of the battery under normal conditions has exceeded my best expectations, and until the last of November, we were handicapped with a lack of means for handling all the ore the battery could crush. The month of December found us working very nearly normally, crushing 595·30 tons with the usual unavoidable losses in stamp time, and the results attest the future success of the mill as a metallurgical operation. Since the mill started, 1849·80 tons of ore have been crushed, of an average assay value of $67.60, while the average tailings assay was $9.35. Since the 1st of September, at which time the roaster-stack was changed, the average assay value of the tailings has been $6.72. For the past two months, the roaster charges have been running on regular six-hour roasts, with 2 per cent of salt, and an average chlorination of 49·15 per cent. The average of the chlorinations since the mill started was 49 25 per cent. The ratio of native to combined silver is somewhat the same as with the concentrating ore. The product has been 56 large bars of bullion of an average fineness of 703·28.

The average consumption of cord-wood per day for the year, in our milling operations, has been 12·85 cords, at a cost of $10.78 a cord.

Mr. Blake's New Concentrator.—A little less than a year ago, Mr. F. H. Blake, foreman of mill No. 1, in the entire absence of any available water supply for the further treatment of the tailings from mill No. 1, experimented upon a device for automatically concentrating them as they flowed directly from the mill. His device was put practically in operation, and has been treating the tailings most of the year, with the result of an accumulation of about 1580 tons, having an average assay value of $31.35 a ton, or a total assay value of $49,533. The experimental run of some fifty tons of these concentrates at the Windsor mill eventually provided us with the method and details for working them successfully by the process of our mill No. 2. Requiring additional pan capacity for the normal mill work, and seeing a further revenue from the continuous concentration of the tailings from mill No. 1, and their further treatment by amalgamation, the remainder of the machinery of what was known as the "Swain mill," at Pinal, was purchased, securing to us a 35 horse-power engine, with four 5-foot amalgamating-pans and two 9-foot settlers. After needed overhauling and repairs, this machinery is now set in place, and will be in operation in a few days, providing us with 8 pans and 4 settlers. A 4-foot clean-up pan has recently been added to the mill.

The past year has surpassed all others in the scarcity of water, and to be prepared for another such emergency, two wells were sunk and substantially timbered, at a point about three miles from Pinal, and about 350 feet apart. The elevation of the wells is about 385 feet above the mills at Pinal, with which they are connected by a pipe line offering a successful opportunity for the application of the siphon. Tests of the wells by steam-pumps showed them to have a combined flow of about 8000 gallons an hour.

We close the year with an abundant supply of cord-wood and general supplies at both mills, and ore-reserves in the mill yards of 1970 tons for mill No. 1 and 510 tons for mill No. 2. The outlook at the mine is flattering, with an abundant reserve, and all our operations are running full-time.

The Delaware & Hudson Canal Company—Annual Report, 1885.

We give the following extracts of the report of the Delaware & Hudson Canal Company from advance-sheets courteously furnished us. From these, we learn, by a little "figuring," that the company sold 3,353,582 tons, or 37,889 tons more than it mined in 1885, reducing its stocks by that amount.

The average cost of mining appears to have been about $1.20 a ton. Transportation and shipping expenses, etc., about 47 cents a ton. Salaries, rent, etc., about 5 cents a ton. Depreciation on stock coal, 7 cents a ton on coal sold, or a reduction of 42 cents a ton on the valuation, which, at the close of 1884, was $2.15 a ton, and at the close of 1885 was $1.73 a ton. The profit on coal was about 35 cents a ton; the profits on railroad, canal, and miscellaneous profits about paying the company's taxes, interest, and loss on leased lines.

The receipts for 3,353,582 tons of coal sold were an average of $2.14 a ton. The sales in this market, of course, were at far higher figures. Much of the coal was sold at points nearer the mines.

The annual statement of the business of the company for the year ended December 31st, 1885, shows a net profit of $1,186,396.18, or a fraction over 5 per cent on the capital stock:

	Tons.	
Coal produced at the mines of the company	3,315,693.10	
Transported for others	764,883.00	4,080,576.10
The gross receipts were		$15,260,866.66
Expenses		10,724,906 63 $4.535,960.03
Less taxes, interest, and rentals		3.349.563 85
Leaving net earnings		1,186,396.18

PROFIT AND LOSS ACCOUNT OF THE DELAWARE & HUDSON CANAL COMPANY FOR THE YEAR ENDED DECEMBER 31ST, 1885.

Dr.		
To coal on hand December 31st, 1884, tons, 413,579 19/20		$892,804.26
Mining coal		3,975,296.47
Transportation expenses, canal, lease, etc		826 987.52
Transportation to tide-water, via Erie		592,803.07
Rondout expenses		110,004.90
Weehawken expenses		40 845.60
Salaries, rent, miscellaneous and law expenses		149.602.54
Taxes		222,322.85
Interest		1.082.768.08
Loss on leased lines		313 329.83
Balance, being profit for the year		1,186,396.18
		$9,393,161.40
Cr.		
By sales of coal to December 31st, 1885		7,201,048.64
Canal tolls		54,551.38
Net earnings Pennsylvania Railroad		694.940.60
Miscellaneous profits, including insurance fund, rentals, boat-yard account, interest on investments, etc		792,715.61
Coal on hand December 31st, 1885, tons, 375,691 24/20		649,905.10
		$9,393,161.40

CONDENSED BALANCE-SHEET, DECEMBER 31ST, 1885.

Canal		$6,339,210.49
Railroad and equipment		7,134.088.47
Real estate in Pennsylvania, including coal lands		6,472,286.15
Real estate in New York, New Jersey, Connecticut, Illinois, etc		3,156 089.32
Mine improvements		2,388,769 02
Mine fixtures and equipment		406,776.33
Boats, barges, and steamboats		758,076.07
Coal-yards and fixtures		176,779.72
Lackawanna & Susquehanna Railroad		1,02 ,938.15
Cherry Valley, Sharon & Albany Railroad		500,000.00
New York & Canada Railroad		3,597.074.48
Lackawanna Palace Car Company		28,300.00
Mechanicville & Fort Edward Railroad		59,131.31
Schenectady & Mechanicville Railroad		211,765.05
Telegraph lines		14,734 80
Supplies on hand		992,560.71
Shops, machinery, tools, etc		192,495.93
Coal on hand		649,905.10
Advances to leased lines		330,736.88
Miscellaneous assets, namely:		
Bonds		118,551.91
Stocks as follows:		
Albany & Susquehanna Railroad, 8000 shares	$800,000.00	
Rensselaer & Saratoga Railroad, 16,077 shares	1.607,700.00	
Sundry stocks	213,788.34	2,621,488.34
Advances on coal		720,054.99
Cash		2,605,106.93
Bills and accounts receivable		1,359,832.26
		$41,656,642.41
Capital stock		23,500,000.00
Bonds:		
1891	$5.549,000.00	
1894	4,829,000.00	
1917	5,000,000.00	15.378,000.00
Interest and dividends payable January, 1886		596,085 00
Depositors		164,833.26
Dividends and interest unclaimed		51 084.01
Surplus or dividends fund		1.966.640.14
		$41,656,642.41

EXPORTS OF COPPER DURING 1885, FROM ALL PARTS OF THE UNITED STATES.

Month.	Ores.		Ingots, bars, etc.		Sheets.		All other m'f'res.	Total value 1885.
	Tons.	Value.	Lbs.	Value.	Lbs.	Value.	Value.	
Jan	3.046	$432,036	4,351,594	$505.884	2.552	$434	$6,196	$944,550
Feb	1.472	161,430	2,408.128	269,928	2,709	432	11.358	443.148
March	2,268	238,180	3,999,632	444.510	9,821	1,436	9,603	693,729
April	4,723	465,496	2,515,419	275 961	2,050	369	12.883	754,739
May	5,687	612,754	2,383.063	251.306	7,109	1,439	7,536	873,035
June	2,259	239,965	3,813.178	402,523	....	....	7,056	649.484
July	2,442	281,404	3,861.572	372,257	2 469	412	13.651	667.724
August	3,174	374 265	2,774,436	293,321	361	74	7.826	675,476
Sept	1,903	239,057	4,181.505	438,914	33,603	4,189	18.851	700 991
Oct	3,605	367,586	2,612.342	276,220	6,352	983	14,491	659,283
Nov	1,989	212,413	1,627,106	162,014	2,411	523	6,469	381,419
Dec	2,416	254,390	1,693 956	179,695	3,664	498	8,786	443,359
Total	34,984	3,878,896	36.221,931	3,872,553	73,401	10,789	124,709	7,886,937
All 1884	33,672	4,366,910	30.321,295	3,872,436	83,864	16,323	112,505	8,368,174

The copper in the ore and matte classed as "ore" was in 1885 about 57 per cent. The total exports we have estimated at 77,000,000 pounds fine copper = 34,375 tons.

Remarkably Good Tunneling Work.—At Shaft No. 17 of the new Croton Aqueduct, for the week ended January 23d, the contractors drove 110 feet of tunnel with two Rattler drills in each heading, and two dynamic drills on each bench. This is remarkable work, considering that the rock is hard mica hornblende schist, and is certainly a "card" for the manufacturers of the drills used. Let us hear from any one who has done better.

PRODUCTION OF QUICKSILVER IN 1885 AT ALMADEN, SPAIN.

	Flasks.		Flasks.
January	6,556	October	412
February	6.155	November	6,441
March	7,002	December	6,560
April	6.513		
May	7,100		46,739

The mines are always closed during the four summer months. Production in 1882 was 46,591 flasks; in 1883, 46,143; and in 1884, 43,099. The Almaden ores average 10 per cent of mercury, as against an average of 2 per cent in California ores.

THE ANTHRACITE COAL TRADE IN 1885.

PRODUCTION AND SHIPPING STATISTICS.

The year 1885 was not marked by any remarkable features in the anthracite trade.

The companies were working under that ancient device for regulating trade, a "combination," and during the year succeeded in marketing fully five per cent more coal than the 30,000,000 tons it was estimated at the beginning of the year the markets would require.

The "combinations," formed for the regulation of the anthracite trade, are of infinite variety, and the practical working of each leaves so much dissatisfaction at the end of the year that each succeeding year sees some modification in the general plan or in the details of this famous remedy for an overstocked market.

This fact shows conclusively that we have not yet arrived an ideal combination, nor is there much probability of our reaching it while human nature remains as it is.

From the time of the first recorded coal combination, two hundred and twenty years ago, at Newcastle, when twenty-two coal owners met and agreed to raise the price of coal, and to stop mining until stocks were sold, and that famous combination for "the limitation of the vend," that controlled the shipments to competitive points from the Tyne, the Wear, and the Tees, from 1771 to 1845, with a few interruptions due to "bad faith" on the part of some of its members, it seems that combinations have been formed whenever competition became pressing and prices low, and all history teaches us that no such agreement will be carried out in good faith unless it assumes a form that can be enforced by law.

In our own anthracite coal trade, we have had combinations—

1. To regulate the prices of coal, leaving each producer to mine what he could sell.

2. To limit production only, by general suspensions of work at the collieries whenever the stocks of coal increased or the prices were endangered by over-supply.

3. To limit shipments by restricting the transportation facilities, leaving prices without control.

4. Restricting production and regulating prices. And it has been proposed—though the plan has not met with favor—to pool all the coal, and sell it all through a single office.

Each plan has its inherent defects. It is impossible to preserve good faith in regulating prices unless the business is all done from a single office; and even that most simple and practical plan of dividing up the business to be done according to some agreed upon proportions among the companies has not worked smoothly. The difficulties are, first, some company or companies will refuse to join the compact, and will build up business without restriction at the expense of the others; and the difficulty of securing agreement on the quota to be allowed to each. Those who sell cheapest or who exercise greatest skill in marketing their coal object to have their output restricted to the limit made necessary by the high prices or want of business ability of some other producer. These are the seeds of discontent that have been germinating in the coal trade during the past two years, and which now render the renewal of the combination doubtful.

Theoretically, the simple operation of the law of the survival of the fittest should regulate this trade as it does the production of wheat, or cotton, or copper, or lead, or iron. But the struggle for existence involved in this plan would probably bankrupt most of the companies now working. Moreover, the close competition would render necessary the exercise of the strictest economy in every department, and possibly the reduction of enormous salaries and the lopping off of the many dear superfluous necessities that usually aggregate an important figure in the expense accounts of corporations that are making large profits. These are unpopular measures, and their adoption is resisted as long as possible. Moreover, the advantages that nature has given to one competitor over the others may be so neutralized by the burden of debt or by bad management that the outcome of the struggle for existence is doubtful, and the chances so evenly balanced as to make the possible final result of a prolonged war between the coal companies resemble that of the famous Kilkenny cats.

At the present time, the combination of 1885 has ceased to exist, and there is no immediate prospect of a new one taking its place. The Pennsylvania Railroad profits by the combination it does not enter, and the other companies appear to have tired of the arrangement under which they have been contributing *pro rata* to the building up of a formidable rival.

The following tables give the amount of coal shipped from each region, and the total production of the same, which includes the consumption and sales at the mines as well as the shipments reported by the railroad companies. In the early years of the trade, when the coal used in most of the towns in the coal regions, and also in some of the furnaces and rolling-mills, was supplied directly from the collieries, the difference between shipments and production was greater than at present, when all of these are supplied by rail, and the coal is reported, so that the percentage of shipments to be allowed for colliery consumption and sales, which is now estimated at 6 per cent, was formerly in some cases more than three times that.

The "shipments" are frequently referred to as the "total production," which is altogether erroneous, as here explained. This table is the only one published that gives both shipments and total production of anthracite coal.

ANTHRACITE COAL SHIPMENTS AND TOTAL PRODUCTION OF PENNSYLVANIA. IN TONS OF 2240 POUNDS.*

Years.	Wyoming Region.		Lehigh Region.		Schuylkill Region.		Total shipm'nts
	Shipm'nts	Production.	Shipm'nts	Production.	Shipm'nts	Production.	Gross tons.
Before 1820		10,000		3,000		5,000	
1820		800	365	66		500	365
1821		1,000	1,073	1,473		800	1,073
1822		1,200	2,240	2,740	1,480	1,000	3,720
1823		1,300	5,823	6,522	1,128	1,200	6,951
1824		1,700	9,541	10,441	1,567	1,500	11,108
1825		2,000	28,393	29,493	6,500	7,000	34,893
1826		2,700	31,280	32,780	16,767	19,335	48,047
1827		4,000	32,074	34,274	31,360	32,893	63,434
1828		6,200	30,232	33,232	47,284	52,481	77,516
1829	7,000	16,800	25,110	29,110	79,973	87,293	112,083
1830	43,000	58,200	41,750	46,850	89,984	104,584	174,734
1831	54,000	78,300	40,966	47,166	81 854	104,854	176,820
1832	84,900	121.700	70,000	82.700	209,271	243,771	363,271
1833	111,777	161.777	123.001	132,100	252,971	298,333	487,749
1834	43,700	53,008	106,244	128,874	226,692	274,977	376,636
1835	90,000	108,900	131,250	158,812	339,508	410,805	560.758
1836	103,861	125.360	148,211	178,891	432,045	521.478	684.117
1837	115,387	139,041	223,902	269,802	530,152	630,398	869.441
1838	78,207	94,083	213,615	256,979	446,875	521,951	738,697
1839	122,300	146.760	221,025	265,23[illegible]	475,067	545,446	818,402
1840	148,470	177,867	225,313	269,932	490,596	560,421	864,379
1841	192,270	229,955	143.037	171,072	624,466	725,978	959,773
1842	252,599	301,856	272,540	325,692	583,273	659,047	1,108,412
1843	285,605	340,441	267,793	319,209	710,200	819,276	1.263,598
1844	365,911	435,434	377,002	448,633	887,937	1,015,623	1,630,850
1845	451,836	536,329	429,453	509.761	1,131,724	1,298,336	2,013,013
1846	518,389	614 291	517.116	512,783	1,308,500	1,480.247	2,344,005
1847	583,067	689,185	633,507	748,805	1.665,735	1,889,165	2,882.309
1848	685,196	808.531	670,321	790,979	1,733,721	1,973,185	3,089,238
1849	732,910	862,635	781,556	920,002	1,728,500	1,942,168	3,242,966
1850	827,823	972 692	690,456	811,286	1,840,620	2,079,387	3,358,899
1851	1,156,167	1,355,028	964,224	1,130,071	2,328,525	2,705,591	4,448,916
1852	1.284.500	1,502,365	1,072,126	1,254,399	2,636.835	2,967,884	4.993.471
1853	1,475,732	1 723,655	1,054,309	1,231,431	2,665,110	2 984,765	5.195.151
1854	1,603,478	1.868,052	1.207,186	1,406.372	3.191,670	3,572,132	6,002 334
1855	1,771,511	2,060,267	1,284.113	1,493,423	3.552,943	4,130,852	6,608,507
1856	1,972,581	2,288.144	1,351,970	1,568,285	3.602 999	4,143.288	6,927 550
1857	1,952,603	2,261,114	1,318,541	1,526,871	3,373,797	3,906,857	6,644,941
1858	2,186,094	2,527,125	1,380,030	1,595,315	3,273,245	3,741,790	6,839,369
1859	2,731,236	3.151,846	1,628,311	1,879,071	3,448,708	3,979.809	7,808,255
1860	2,941,817	3,388,973	1,821,674	2,098,569	3 749,632	4.319,576	8,513,123
1861	3,055,140	3,513,411	1,738 377	1,999 134	3,160,747	3.634.916	7,954,264
1862	3,145,770	3,608,198	1,351,054	1,549 658	3,372,583	3,937,175	7,869.4 7
1863	3.759.610	4 304,754	1.894.713	2,169.446	3,911,683	4,478,877	9.566,006
1864	3,960,836	4,526,635	2.054.669	2.348,233	4,161,970	4,756,532	10 177,475
1865	3.254,519	3,720,717	2,040.913	2,082.858	4,356,959	4.979,457	9,652,391
1866	4,736,616	5.413,958	2.179.364	2,433,280	5,787,902	6,245 599	12,703,882
1867	5.325,000	6,089,272	2,502,0b4	2,356,867	5,161.671	5,899.505	12,9*8,725
1868	5,968,146	6,846,699	2.502,582	2,865,820	5.330,737	6.097.947	13,801.465
1869	6.141,369	7,279,543	1,949,673	2,313,589	5 775,138	6,782,146	13,866,180
1870	7,974,660	8,814,024	3.239 374	3,489,364	4 968,157	5,516,312	16,182,191
1871	6,911,242	7,667,129	2,235,707	2,568,764	6,552.772	7,120.340	15,699,721
1872	9,101,549	10,698,523	3,873.339	4,202.824	6,694.890	7,131,209	19.669.778
1873	10.309,755	11,711,0 3	3,705.. 96	3,801.447	7,212.601	7 335.333	21,227.9'2
1874	9.304,408	10.204,764	3.773,836	4,139,561	6,866,877	7,286.793	20.145.121
1875	10 596,155	11,045,998	2,834.605	2.867.876	6,281,712	6,713,113	19 712,472
1876	8,424,158	8.929,607	6.221,934	6,595.250	3,854.919	4,086,214	18,501,011
1877	8,300,377	8,798,399	8.195 042	8 6*6,744	4.332.760	4,592.725	20,828,179
1878	8,085,587	8.570,722	6,282,226	6,659,159	3,237,449	3.431,69	17,605.262
1879	12,586,293	13,341.475	8,960,829	9.478,478	4,595,567	4,871,3[illegible]3	26,142 689
1880	11,419,279	12,104.435	7,55[illegible],742	8,008,026	4,463,221	4.773,014	23,437,242
1881	13,951,383	14,784,465	9,253,958	9.809,195	5,294.676	5,612.235	28,500,017
1882	13.971,371	14,809.653	9 459,288	10,026.845	5,689,437	6.040,803	29,120 096
1883	15,604,492	16,540,761	10.074 726	10,679,209	6,113,809	6.480.637	31.793,027
1884	15,677,753	16.618,418	9,478.314	10.047,012	5,562,226	5,895 959	30,718,293
1885	16,236,470	17,210,558	5,898,634	6,252,552	9 488,426	10,057,751	31,623,529

* The shipments have been compiled from original and authentic statistics, by John H. Jones, official accountant of the coal companies.

Consumption and sales at the mines from 1820 to 1875 from the most reliable sources obtainable. Much of this was collected by the late Benjamin Bannan, of Pottsville.

From 1876 to 1885, the sales and consumption at the mines are estimated by Mr. John H. Jones to amount to 6 per cent of the shipments.

Table No. 2 gives the monthly shipments and the stocks of coal at tide-water, in order that the actual amount disposed of monthly can be readily seen.

MONTHLY SHIPMENTS AND STOCKS OF ANTHRACITE AT TIDE-WATER SHIPPING PORTS; ALSO CONSUMPTION AT THE MINES, AND TOTAL PRODUCTION OF ANTHRACITE COAL FROM 1882 TO 1885. TONS OF 2240 POUNDS.

	1885.		1884.		1883.		1882.	
	Shipm'ts.	Stocks	Shipm'ts.	Stocks	Shipm'ts.	Stocks	Shipm'ts.	Stocks
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
January	1,641,803	837,104	1,899,572	637,987	2,075,741	616,759	1,8[illegible]3,910	586,933
February	1,767,707	665,565	1,892,637	632,041	1,937,997	575,69[illegible]	1,605,243	546,315
March	2,02[illegible],790	431,424	1,881,463	588,229	2 375,512	5[illegible],1[illegible]2	2,10[illegible],042	666,318
April	2,3[illegible],223	420,504	2,828,2[illegible]9	859,45[illegible]	2,511,710	719,2[illegible]2	2,1[illegible],802	752,65
May	2 439,765	525,611	2,628,142	858,837	2,439,2[illegible]	4[illegible]4,377	2,256,097	611,411
June	2,49[illegible],32	582,[illegible]63	2,029,179	704,838	2,670,381	5[illegible],2[illegible]0	2,625,039	5[illegible],136
July	2,801,606	7 4,700	2,[illegible] 2,614	672,267	2,615,686	502,159	2,757,248	5.5 532
August	3,023,910	988,782	3,55[illegible],410	885,716	3,324,711	576,132	2,894,702	608,042
September	3,259,183	815,907	2,677,890	885,591	3,084,355	53[illegible],49[illegible]	2,558,143	513,934
October	3,562,166	661,616	3,06[illegible],434	781,810	3,426,273	604,865	2 915,[illegible]37	521,050
November	3,279,116	670,4[illegible]3	3,031,953	712,392	3,198,004	636,380	2,797,37[illegible]	53[illegible],891
December	2,9[illegible],825	7[illegible],545	2,63[illegible],736	874,681	2,133,245	748,830	2,5[illegible]9,140	562,116
Total shipments	31,623,530		30,718,293		31,793,027		29,120,0[illegible]6	
Consumption and sales at the mines = 6 p c of shipments	1,897,410		1,843,098		1,907,581		1,717,206	
Total production	33,510,940		32,561,391		33,700,608		30,837,302	

Table No. 3 gives the share that each of the great coal carriers had in the shipments of coal during the past eighteen years. We have given the amount of coal shipped by each, and the percentage that each had of the whole. From this table, we can see at a glance that the Reading (including the Central New Jersey) has lost about per cent of the whole of the shipments, while the Pennsylvania Railroad has gained per cent, and the Erie two per cent. The other companies

have varied but little in the proportion of the whole they have sent to market.

PROPORTIONAL SHIPMENTS OF ANTHRACITE BY THE SEVERAL COAL ROADS.
Tons of 2240 pounds.

ROADS.	1885.		1884.		1883.		1882.		1881.	
	Shipments. Tons.	Per cent.	Shipments. Tons.	Per cent.	Shipments. Tons.	Per cent.	Shipments. Tons.	Per cent.	Shipments. Tons.	Per cent.
Read. RR.. } Cent. N. J. }	11,680,780	36·94	11,163,920	36·30	12,232,401	38·49	{ 7,000,113 { 4,211,052	24·04 14·46	6,940,383 4,085,423	24·35 14·30
Lehigh Val..	6,107,445	19·32	5,935,254	19·30	6,271,773	19·73	5,933,740	20·38	5,721,869	20·07
D., L. & W..	4,937,834	15·78	5,204,362	16·93	5,079,123	15·97	4,638,717	15·93	4,388,969	15·40
D. & H.....	3,301,874	10·44	3,362,680	10·93	3,512,979	11·05	3,203,168	11·00	3,211,406	11·27
Pa. R.R.....	3,393,685	10·74	3,160,287	10·30	2,773,419	8·72	2,332,974	8·01	2,211,363	7·80
Pa. Coal Co..	1,500,088	4·71	1,307,946	4·23	1,541,145	4·85	1,469,821	5·05	1,475,380	5·18
Erie.....	651,296	2·07	528,546	1·71	383,194	1·20	330,511	1·13	465,230	1·63
Total shipments.....	31,623,530		30,756,995	100.	31,793,027	100·0	29,120,096		28,500,016	
C'nsumption at mines — 6 per cent of shipm'ts	1,877,411		1,845,420		1,907,587		1,747,206		1,710,001	
Total production....	33,500,941		32,602,415		33,700,615		30,867,302		30,210,017	

ROADS.	1880.		1879.		1878.		1877.		1873 to 1876.	1868 to 1872.
	Shipments.	Per cent.	Shipments.	Per cent.	Shipments.	Per cent.	Shipments.	Per cent.	Per cent.	Per cent.
Reading RR.. ..	5,933,923	25·31	7,442,617	28·47	5,112,218	27·47	6,842,105	32·83	27·84	30·55
Cent. N. J.....	3,470,141	14 80	3,895,558	14·63	2,264,979	12·17	2,837,500	13·62	13·41	10·97
Lehigh Valley....	4,394,533	18·75	4,405,957	16·86	3,403,318	23·68	4,511,331	21·65	20·04	19·26
D., L. & W....	3,550,348	15·15	3,867,407	14·79	2,180,672	11·72	2,089,523	10·03	12·26	11·72
D. & H.....	2,674,704	11·41	3,014,117	11·53	2,046,234	11 00	1,918,617	9·21	13·06	13·72
Pa. RR.....	1,864,039	7·95	1,682,106	6·43	1,362,673	7·33	1,530,594	7·35	8·04	7·42
Pa. Coal Co.....	1,128,405	4·90	1,427,150	5 46	957,022	5·15	1,118,011	5·31	6·35	6·66
Erie.....	411,094	1·75	477,782	1·83	278,133	1·50	.....	.....	.....	.....
	23,437,242	100·0	26,142,689	100·0	18,605,848	100·0	20,847,681	100·0	.....	.. ..

DISTRIBUTION OF ANTHRACITE COAL.

TONS OF 2240 POUNDS.	1884.	1883.	1882.	1881.
Penna.,New York, and New Jersey.....	20,656,297	21,830,504	19,957,789	{ 24,911,454
New England States.....	5,112,825	5,387,700	5,064,775	
Western States*.....	2,736,099	2,537,174	2,213,107	2,079,134
Southern States, including Delaware, Md., and D. C.....	1,336,070	1,284,093	1,168,730	800,000
Pacific Coast.....	8,839	24,635	49,065	15,000
Dominion of Canada.....	837,185	690,498	616,875	694,428
Foreign ports.....	30,978	38,428	49,735	.....
Total shipments	30,718,293	31,793,028	29,120,076	28,500,016
Shipments to competitive points†	12,009,855	13,148,185	12,018,764	12,169,030

* Western States = all west of Buffalo, Erie, Pittsburg, and Baltimore.
† Competitive = tonnage passing out of the Capes of the Delaware to New York harbor, Hudson River, Long Island Sound, and Atlantic Coast north of Point Judith. Competitive tonnage in 1885 was 11,956,587 tons.

N.B.—The want of space prevents our publishing, this week, the tables of prices and other financial statistics of the coal trade, which will be found of great value. They will appear next week. R. P. R.

(TO BE CONTINUED.)

TWO NEW PROCESSES FOR COPYING DRAWINGS

Black on White.—A new process, known as "Shawcross's patent sensitized paper," the lines of which are black and the background white, has recently been introduced in England. The manipulation is exactly similar to the ferro-prussiate process. The sensitized paper is originally of a bright yellow color, and possesses the following properties: If immersed in water, the paper rapidly turns black, or if first exposed to direct sunlight, it is bleached, and assumes a pure white face, after which water has no effect upon it; hence, all that is necessary is to expose the sensitized paper with the drawing over it, just as in the ferro-prussiate process, to the light, that portion of the prepared surface immediately underneath the lines of the tracing remaining unaffected, while the whole of the remainder is bleached. These lines will immediately turn black when the paper is immersed in water. The usual precautions must be observed in working with the paper. The paper is sold in rolls 11 yards long and 29 inches wide, by George J. Poore & Co., stationers, Castle street, Liverpool.

Blue on White.—Mr. A. H. Haig described, at a meeting of the Engineers' Club of Philadelphia, the following process for making photographic copies of drawings in blue lines on white background, which was invented by H. Pellet, and is based on the property of perchloride of iron to become converted into protochloride on exposure to light. Prussiate of potash, when brought into contact with the perchloride of iron, immediately turns the latter blue, but it does not affect the protochloride. A bath is first prepared consisting of 10 parts perchloride of iron, 5 parts oxalic or some other vegetable acid, and 100 parts water. Should the paper to be used not be sufficiently sized, dextrine gelatine, isinglass, or some similar substance must be added to the solution. The paper is sensitized by dipping in this solution and then dried in the dark, and may be kept for some length of time. To take a copy of a drawing made on cloth or transparent paper, it is laid on a sheet of the sensitive paper and exposed to light in a printing frame or under a sheet of glass. The length of exposure varies with the state of the weather, from 15 to 30 seconds in summer to from 40 to 70 seconds in winter, in full sunlight. In the shade, in clear weather, from 2 to 6 minutes, and in cloudy weather from 15 to 40 minutes may be necessary. The printing may also be done by electric light. The print is now immersed in a bath consisting of from 15 to 18 parts of prussiate of potash per 100 parts of water. Those parts protected from the light by the lines of the drawing immediately turn blue, while the rest of the paper, where the coating has been converted into protochloride by the effects of light, will remain white. Next, the image is freely washed in water and then passed through a bath consisting of from 8 to 10 parts of hydrochloric acid to 100 parts of water, for the purpose of removing protoxide of iron salt. It is now again washed well in clean water and finally dried, when the drawing will appear in blue on a white background.

THE OSCEOLA HOISTING-ENGINES.

The hoisting-engines illustrated herewith were designed by Mr. Edwin Reynolds, and built by the Reliance Works for the Osceola Consolidated Mining Company, of Opechee, Michigan, Lake Superior.

They are a pair of wrought-iron frame engines having the Reynolds positive valve-gear, embodying all the latest improvements for adjusting or regulating the cut-off valves. The rope-drums are placed on the crank-shaft and are held in place by powerful clutches, which can be engaged or disengaged by operating a lever situated on the engineer's platform; each drum is provided with a powerful brake, so that one cage may be hoisted while the other is lowering, or both cages hoisted or lowered together. A "miniature," or index, which is connected with the drums, always indicates the position of the cages in the shaft. The reversing gear and link motion, as applied to this machine, are worthy of the careful attention of parties intending to purchase hoisting machinery.

Only one eccentric is used to run the engines in either direction, and by the peculiar design and application of the link, the changes in the "lap" and "lead" of the valves, and variations in the automatic cut-off, are avoided; and all the elements of economy in steam and fuel are preserved, whether the engines are running over or under. The engines are at all times run with the throttle wide open; the speed and power are determined by the position of the cut-off mechanism, which is controlled and set for any desired speed or power by a lever on the operator's platform.

The reversing gear is operated by a new steam reversing apparatus, which follows precisely the movement of the engineer's reversing lever, and securely holds the link in any position where this reversing lever may be locked; by this means, the engines can be stopped, started, run over or under without closing or opening the throttle. The working of the entire machine is controlled by levers and hand-wheels, which are conveniently arranged on a raised platform situated between the two steam-cylinders of the engines, exposing all the working parts of the machine to the full view of the operator.

These machines are furnished with any size of steam-cylinders and rope-drum, and the design can be modified to suit any location or conditions.

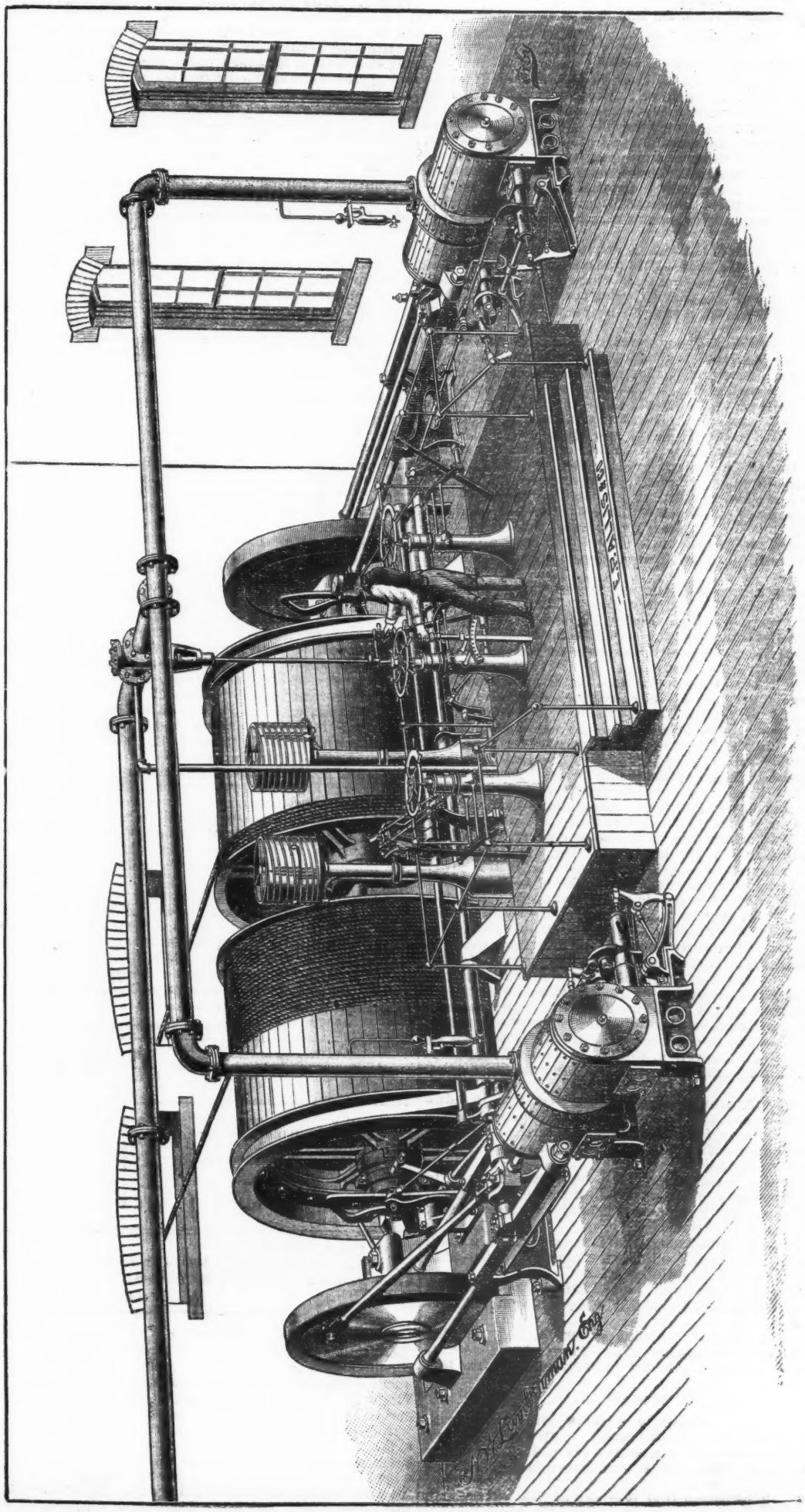
The same manufacturers have recently furnished the Joliet Steel Company with rolling-mill engines 40 inches diameter, 60 inches stroke, making 110 revolutions a minute.

A New Apparatus for the Perfect Combustion of Natural Gas in Furnaces.—An apparatus has been invented by E. J. Dashbach, of Pittsburg, Pa. It is the application of the Argand burner principle to the new fuel. It has been introduced at the mills of Jones & Laughlins, and at the Linden steel-works, where, it is claimed, the heaters are enabled by its use to make their heats in one third of the time formerly required, that is, in one hour instead of three hours. The new process is said to be a great economizer of natural gas, enabling the furnaces to run on two ounces of pressure, and as the combustion takes place in the furnaces, the stacks are not burned.

The Tunguragua Volcano in Action.—Accounts of extraordinary phenomena come from Ecuador. At Chimbo, there were showers of earth on January 11th from five to six P.M. At about nine P.M., a shock of earthquake was felt in Guayaquil. At midday on the 12th ult., loud rumbling noises were heard, and they continued up to last accounts. These noises were heard in different parts of the country. On the night of the 14th, there was a fall of ashes at Guayaquil. These phenomena were at first attributed to the eruption of Cotopaxi; but intelligence has been received from the interior to the effect that there has been a terrible eruption of the Tunguragua volcano.

Co-operation.—Co-operation has been tried at Phœnixville, with apparently good results. The business was chiefly in groceries, and, for about three months, in coal. Six per cent interest was paid on the capital, and, after paying all expenses, allowing ten per cent for depreciation of fixtures, and putting away five per cent in a sinking fund, there still remained four hundred dollars, which has been distributed to customers of the store in proportion to their respective purchases. This final division amounted in the last quarter to seven per cent for non-members. Coal has been sold at $1.10 a ton less than the regular rate, and the society claims to have saved the people of the town in this item alone at the rate of $15,000 a year through its own sales and the effects of its competition.

Mineral Oils in India.—The earth oil industry in Burmah does not fulfill the sanguine expectations that were at one time formed of it. The largest operations have been undertaken by the Boronga Company, on the Boronga Islands of Akyab, and on the Ramree Island of the Kyookpyoo District. Last year, the company sank eight new wells, but the whole amount of crude oil pumped up was only 234,000 gallons, and the refined oil was selling at 9s. a case in Kyookpyoo, while American petroleum was quoted at 10s. 6d. a case in Calcutta. Two other companies also started during the year; one was fairly successful; the holes bored by the other all turned dry. In fact, no oil-bearing stratum has yet been discovered in Burmah equal to the American or Caspian fields, and the natives appear to work what there are more profitably than Europeans. In Assam, the Assam Railroads and Trading Company has a concession for working the oil-bed at Makum, but as yet it has taken no advantage of it.



HOISTING-ENGINES OF THE OSCEOLA MINING COMPANY.

MODERN AMERICAN METHODS OF COPPER SMELTING*

By Edward D. Peters, Jr., M.E., M.D.

CHAPTER XII.

REVERBERATORY FURNACES.

A sufficient amount of the sand—usually from 4 to 5 tons—being thrown into the heated furnace (either as such, or mixed with from 3 to 5 per cent of pulverized slag), a moderate fire is maintained, while a steady stirring and rabbling is kept up through the side and front doors, until every particle of moisture and carbonic acid and other gases is expelled, and the heat gradually raised to such a temperature as to insure the decomposition of all organic material. This operation may require from 3 to 8 hours, according to the nature of the material. Both the temperature and time are matters of great importance, having a marked effect upon the final result; but can only be learned by experience, as they vary with each different sand.

Toward the close of this period, the sand is gradually brought into the proper shape for the bottom, and thoroughly pressed and stamped into place by means of long paddles and stampers, worked through the door openings. No great pains need be expended upon the lower hearth, as it will, of course, be entirely covered and its shape obliterated by the superior layer.

The doors are then closed; the tap-hole bricked up and covered with a heap of sand, and every crack and orifice about the whole furnace completely stopped and closed. The fire is gradually urged until the highest possible temperature is reached and maintained for a couple of hours, the entire period of heating requiring from 6 to 14 hours, according to the heating capacity of furnace and fuel. The interior condition of affairs is watched through a peep-hole in the front door, which is provided with a clay plug, and, after a proper maintenance of the highest temperature, the fire is gradually slackened and the furnace cooled down. This operation demands the greatest care and circumspection, as the premature opening of a door or a sudden draught of cold air may cause the appearance of a crack or blister in the porcelain-like surface of the sand hearth. Several hours must elapse before the doors can be taken down and the results of the operation inspected. The interior of a reverberatory furnace under these circumstances is quite an interesting sight.

Long stalactites of molten fire-brick hang down from the arch over its entire surface. The side walls are not only glazed, but actually fused until they have begun to soften to a considerable depth, and the hard and glistening semi-fused surface of the new hearth is strewn with fragments of brick from the crown, and little heaps of molten fire-clay corresponding to the pendent stalactites.

Unless very serious cracks exist, no notice need be taken of them, and blisters and irregularities may be entirely overlooked, as the upper hearth is to bear the brunt of the work. After slow and perfectly even cooling to a dark-red heat, about 1800 pounds of moderately basic, fusible slag, crushed to the size of chestnuts, is spread over the entire surface, being charged by means of long-handled paddles, and on no account thrown in carelessly, to be subsequently leveled with rabbles, as is often done. The doors being again tightly closed, the slag-charge is quickly smelted down, two hours being amply sufficient for this purpose. This layer of slag will be entirely absorbed by the porous sand bottom, which, after a second cautious cooling, should be again charged with a somewhat larger burden of slag, with which are mixed a few hundred pounds of low-grade matte (30 per cent). After this is melted down, a considerable portion will probably be found in a pool near the tap-hole, from which it should be immediately evacuated. If the furnace is to be used for concentration work, or especially for the production of blister copper, still another charge should be melted on the lower hearth, consisting principally of matte of the same grade as the former, and should be tapped as soon as sufficiently liquid. In this way, the lower hearth will be pretty thoroughly saturated with matte of low tenor, thus preventing the absorption of an equivalent quantity of richer metal in case the same should penetrate from the upper hearth. The tying up of a large amount of copper may thus be guarded against.

After a final cooling, the sand to form the upper hearth is thrown in, and after a careful calcining and leveling, should be stamped into place with the utmost care, sloping gently toward the tap-hole from every point.

The fusion is executed in the manner already described, and in addition a careful watch should be maintained at the peep-hole to observe any fragments of brick that may fall from the arch during the early period of the fusion. After the softening of the sand has once begun, no further manipulation is permissible.

The cooling after the fusion must be executed with extreme care, to prevent cracking and blistering, and as soon as a dull-red heat is reached, the slag and matte charges already enumerated should be successively melted, with alternate periods of cooling.

As a final preparation before introducing the first ore-charge, a small quantity of finely crushed slag should be thrown around the entire edge of the hearth at the junction of sand and fire-brick.

Above this, a thick bolster of "fettling" (mixed fire-clay and crushed quartz) should be tightly forced into the angle between hearth and side-walls, including the bridge-wall.

An hour's brisk heat will dry and consolidate the fettling, and the regular work of the furnace may begin—small charges being used at first, and no large quantity of metal allowed to accumulate before tapping.

MANAGEMENT OF FURNACE.

The experienced furnace-man constantly watches his furnace with reference to the safety and condition of its bottom. After a few hours' firing on a fresh charge, the workman introduces his rabble, and by the feeling of the sand when gliding over the bottom, determines at once the condition of things.

If slippery and sticky, it indicates that portions of the charge still adhere to the hearth. These are removed so far as possible by the rabble and dissolved by a short additional heat, until the rabble glides smoothly over a plane, granular bottom, which is the upper surface of the hearth proper. After this condition is once attained, every additional moment of high temperature is not only wasted, but is positively detrimental to the hearth, which lacks the protection of the semi-fused ore, the liquid matte soon attaining a high temperature, and, if exposed to the air, boiling in a manner that may prove highly dangerous to the bottom. This is the case when concentrating matte or making blister copper—operations very severe on the bottom, but rendered less dangerous by being conducted at a lower temperature than is required for smelting proper.

Equally detrimental may be a high temperature with a small charge, where the unprotected portions of the bottom may become so softened as to rise in large flakes, being literally floated up by the superincumbent metal.

Any large piece of iron, such as a rabble-head, may cause a hole in the bottom, and in endeavoring to float up an old bottom, nothing is more effective than the introduction of a number of large fragments of old iron. A bottom may be often patched to advantage when only locally damaged. When any such condition is discovered, the hearth should be immediately emptied, and the damaged portion, which usually shows a decided cavity or depression, should be most carefully evacuated, fresh sand being repeatedly introduced and again removed with the rabble until it is completely dry. The hole should then be filled and leveled up with ordinary bottom sand, which must be fused, and saturated with the same precautions as in the case of the original bottom. In this way, a bottom may often be saved for many months at a very slight expense.

In direct connection with the management of the bottom is the proper fettling of the furnace. The entire life of the side walls and safety of the bottom depend upon the care and conscientiousness observed in maintaining the dam that incloses the molten, liquid pool and protects the fire-brick. In default of this safeguard, the side walls are quickly undermined, a groove several inches in depth being cut into the mason-work during the smelting of a single basic charge. Nothing then remains to prevent the descent of the metal between the wall and bottom until the latter is floated up and ruined, and a large amount of copper temporarily lost. The best fettling is formed of pure, white quartz, crushed through a 3-mesh screen and mixed with sufficient plastic fire-clay to form balls, which may be placed at exactly the required point, and forcibly pressed and molded into place. The quartz may be replaced by ordinary bottom sand, which, however, is less permanent and solid. When smelting basic ore, the hearth may require fettling after every charge; but with a quartzose mixture, days may elapse without any necessity for renewal. Safety in this particular is only obtained at the expense of constant watchfulness.

The size of the fire-box and depth of grate below the upper surface of the bridge are very variable factors, depending upon the quality of the fuel and degree of temperature. (*See* former table of measurements.)

The best and most economical results are obtained by the use of the clinker grate, which is virtually a gas generator, a deep layer of clinkers being maintained upon the grate-bars, penetrated by numerous openings through which the air passes, being heated to a high temperature before it unites with the gas generated from the coal, which lies upon the upper surface of the bed. A certain proportion—from one third to one half—of caking coal is required for this method of combustion, and the grate-bars must be at a much greater depth than for ordinary non-caking fuel.

Lignites, or any free-burning, non-caking coal, require a shallow grate and a large flue, while wood behaves in much the same manner, requiring, however, the introduction of air through holes in the roof above the bridge, on account of the great volume of combustible gases generated.

It is almost impossible to give any general rule for the amount of fuel required for a reverberatory furnace. When engaged in smelting ores, a much larger quantity must be consumed than in making blister copper or in the refining process, where only a very moderate temperature is needed for a considerable proportion of the time. The following table gives the average results obtained by the writer, and comprises several varieties of fuel, and most of the different operations executed in the reverberatory furnace:

TABLE OF REVERBERATORY WORK.

OPERATION.	Fuel.	Size of fire-box in feet.	Size of hearth.	Fuel used per twenty-four hours.
Ore smelting	Lignite	3¼ × 4	9 × 14½	5¼ tons
Same furnace....	Bituminous coal	3¼ × 4	9 × 14½	3¾ "
" " ...	Wood	3¼ × 4	9 × 14½	6¼ cords
Ore smelting	Bituminous coal	3½ × 4	10 × 15	3¾ tons
Blister smelting..	" "	3½ × 4	10 × 15	2¼ "
" " ..	Wood	3½ × 4	10 × 15	4¾ cords
Refining.....	"	3¾ × 4½	9 × 13½	5 "
"	Coal	3½ × 4	9½ × 14	3 tons

One ton = 2000 pounds.

Anthracite may be employed in this form of furnace, requiring a tight fire-box, and an artificial blast of considerable volume and slight pressure.

(TO BE CONTINUED.)

Production of Coal in Borneo.—The output of coal from the government mines at Sadong shows an increase of 828 tons in 1884 on that of 1883, the quantities being 5866 tons against 5038 tons, and there appears a balance between receipts and expenditure on the mines of $90,989 to the good. There is a prospect that mining in the coal-fields of Silantek, which was carefully explored and surveyed ten years ago, but not hitherto worked, will be begun before long. Toward the end of the year, the position was again examined and favorably reported upon, the previous accounts of the good quality of the coal and extent of the deposit being confirmed to a syndicate in England. One serious difficulty will be the laying of the lines of rail that will be needed for the traffic between the mines and the most convenient point for shipping, a distance of twenty miles, with deep swamps in many parts. Otherwise, the undertaking presents no serious obstacles, and mining will be easy and inexpensive, owing to the favorable run of the seam.

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FLUE-DUST.*

Written for the Engineering and Mining Journal, by Malvern W. Iles, Ph.D.

The method of simply mixing flue-dust with water and feeding it back into the furnace has been tried by us under nearly every possible variation; for example, at one time, when there was a large accumulation of dust on hand, and the furnaces were making dust rapidly, I tried smelting slag and flue-dust together. Aside from disarranging the normal working of the furnace, I found that I blew back into the chamber perhaps more dust than I smelted, and I have come to the conclusion that, while it *is* possible to worry a little dust through the furnace in this way, yet the method is a crude and imperfect one.

The method of mixing the dust with from 8 to 10 per cent of lime and feeding it back into the furnaces directly, is, in my opinion, rather an antiquated one. If, however, this lime mixture be spread upon large ore mixtures, then it is not so bad; yet even then, it is questionable whether the lime does any good, and whether equally good results would not be accomplished if the dust was simply mixed with water and spread upon the ore-bed mixtures. We have obtained far better results by mixing the dust simply with water and placing it upon the *bottom* of large ore mixtures, and then again wetting it down by means of an ordinary hose, and, where possible, allowing the first succeeding layer or layers of ore to be argillaceous. By now piling on the dust from 1000 to 1500 tons of ore, the dust will be more effectually smelted, since it will be more uniformly fed to the furnaces. We regard this last-named method as a good one when we can properly fulfill the conditions.

We have tried the plan of mixing the dust slightly with water, and also in various proportions with various ores, and then casting into bricks with a brick-machine that gave a pressure of 40 tons to each brick, and still the bricks would not, after several days, withstand the rough usage that is inevitable in practice; so that I must regard this method as an unsatisfactory one, unless under peculiar circumstances. Some of the circumstances may be briefly mentioned, as follows: Where labor is cheap; where there are considerable quantities of clayey ores that can be mixed with the flue-dust in the required proportions; and finally, the bricks should be dried in a hot sun, such as they have, for example, in Arizona; or, what is still better, to have a system of three kilns, one of the kilns where the bricks are being removed, the second kiln where the bricks are drying, and the third kiln where the bricks are baking or semi-fritting. A number of experiments have demonstrated that, if the bricks are slowly dried and then submitted to a gently increasing heat until the exterior just begins to melt or sinter together, the bricks will then admit of any degree of rough handling without breaking and without crumbling upon the exposed surfaces. The cost of treating dust in this manner is its chief objection; yet there may be circumstances or conditions where the above detailed method would be exceedingly applicable. We did not observe any ill effects from "the laminating effect of pressure" when we were sufficiently careful in drying the bricks. This method has many features that should commend itself to our attention, and the most valuable one lies in the fact that the volatile salts of lead, such as the chloride, bromide, iodide, and others, are fixed in the brick, and we should, therefore, expect a greater saving of lead than by any other method.

I have known of cases where very rich fine ore was pounded into fruit-cans and then fed into the furnaces, and am persuaded that, where only small amounts of very rich fine ore are to be handled, this ingenious method could be applied to advantage.

We once took some very fine rich ore, mixed it with water and lime, filled old sacks with it, allowed it to freeze solid, and then cast a sack at a time into the furnace. This also was satisfactory for small amounts of ore, but is scarcely applicable in the summer.

The best way to handle not only flue-dust, but also fine ore, according to our experience, is to fuse it in properly constructed furnaces. Nearly all sulphurous ores should be roasted and then fused; and in working such fusing-furnaces, it is not only simple but entirely feasible to fuse all of the flue-dust with scarcely any labor, and without increasing the amount of fuel. We are now fusing all of the flue-dust by throwing it into the side-doors of the roasting part of the fusing-furnaces as a "*side charge*," or it may be regarded as so much *extra charge*, in amounts of from 50 to 150 pounds, per each half charge, according to the amount of dust on hand. We have tried throwing the dust directly into the fusing-boxes; but this is not to be recommended, as it produces a sticky mass, which will in time injure the bottoms; and furthermore, one is apt to reduce some lead to the metallic state, owing to the presence of the carbonaceous material therein contained; also, the oxide of lead is apt to form the easily fusible silicate at the expense of the furnace bottoms. Again, if we throw the dust into the first door above the fusing-boxes, it is also very bad, as the finely divided carbon will reduce sulphates to sulphides, which, of course, is taking a step in the wrong direction, as we know the sulphates are decomposed by the elevated temperature obtainable in the fusing-furnaces, by silica forming lead silicate, while this is only true to a limited extent of lead sulphide. Then, again, there is too great and sudden a reduction of temperature at this point for good work; the dust will also cause accumulations at this point, and furthermore, some metallic lead has been noticed here, directly attributable to the carbon in the flue-dust.

The third or fourth door is generally best, as above suggested; and if the dust be quite moist, by all means throw it into the last door, or the door farthest removed from the heat.

It may be readily seen that, if the dust is rather dry, there remains the liability of some of it entering the dust-chambers in connection with these furnaces, which is as bad as if it was in the chambers in connection with the stack-furnaces; yet the amount that thus enters these chambers is in reality quite small.

I have endeavored to cause flue-dust to adhere to blast-furnace slag, by allowing the slag directly from the furnace to run into pots containing dust; and while there was considerable dust that would adhere to the slag, yet, owing to a rapid expulsion of gases, there would be much flue-dust driven off in clouds and practically lost. This method is, therefore, not to be commended.

There are causes for the increased production of flue-dust directly attributable to the nature and kind of fuel used; for example, charcoal produces far more flue-dust than coke, and there are some kinds of coke that will produce far more flue-dust than others. Then, again, the manner in which the furnaces are manipulated has a very important bearing upon this subject; and in order to illustrate this point, I will say that I have known instances where high blast was looked upon as the panacea for all of the troubles the lead smelter ever had or was likely to have. It made not the slightest difference whether fine ores or coarse ores were used, or high lime slags or low lime slags were produced; whether the ores were siliceous, manganiferous, zinciferous, or whether the furnaces themselves were high or low, yet *high blast must be had.*

The idea that a large tonnage is the only thing to be considered, and that the metallurgist will thereby gain a reputation and notoriety, is in and of itself a good way to delude the proprietors of works and hoodwink one's self; yet I can not but think that a sober, intelligent consideration of the blast to be used is of paramount importance, and particularly is this the case when we are handling metals as volatile as

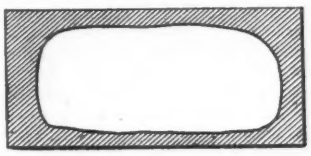

Fig. A.

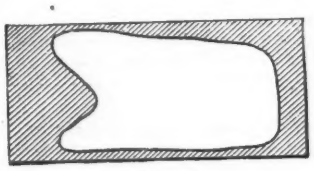

Fig. B.

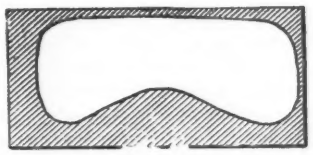

Fig. C.

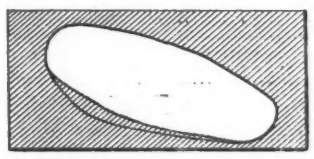

Fig. D.

lead. The question is not simply to smelt the valuable ores that nature has supplied us, but how best to treat the ores in order to effect the greatest saving of their valuable contents, or, in other words, how we shall make and save the most money.

From what has been said, it will be seen that, when the ores are fine, not too high a blast should be used, and we must so regulate the hight of the column of the shaft-furnace as that the blast may come through the charge evenly and without whizzing or whistling sounds.

When the ores are coarser, feed the furnace up higher and increase the blast. If the ores are in general pure, coarse, and siliceous, and contain but little zinc, it is found best to make a slag high in lime, use high furnaces, and also use a high blast.

The blast should never be so high as to produce hot tops, or what are sometimes termed "fire-tops" or "over-fire."

Gas or flame should never be visible; yet there are times when this is next to an impossibility to prevent, owing to many causes, one of which is due to large percentages of zinc in the charge. In this case, the vapor of metallic zinc arising, mixed with carbon dioxide, and coming in contact with heated carbon, produces zinc oxide and carbon monoxide, which gas will burst out into a bluish flame for a short period, and then again cease. Under such circumstances, the amount of lime should not be too large.

The chief cause for the increased production of flue-dust, so far as the manipulation of furnaces is concerned, is due to "hangings," or accretions that form upon the walls. These hangings assume very diverse forms, often causing not only fire to be noticed at the tops, but also causing a concentration of the blast, producing what we term "blow-holes," where dense volumes of smoke and dust belch out intermittently.

When these hangings assume a more or less regular shape, Fig. *A*, we do not deem it necessary to disturb them, since they will often cause the furnace to run faster and without any apparent increase of dust. But when the furnace hangs irregularly, either upon the front or back walls, or upon either side, Figs. *B C*, then the furnace should be dropped down and the obstructions barred off with suitable steel bars.

The manner of barring we will dwell upon at some future time. Then again the hangings will assume the form shown in Fig. *D* (which is the very worst case we have noticed), and dust will be driven into the dust-chamber very rapidly; in fact, we call to mind an instance in which one furnace produced as much dust as eight other furnaces having exactly the same dimensions.

Sometimes the furnace will hang at both ends at the same time; then again there will be large protuberances extending out on both side-walls.

In the continuous working of shaft-furnaces, there will inevitably be accretions more or less in amount upon the walls; and just as soon as a furnace fails to make or produce the requisite amount of bullion, we should examine carefully the manner in which the blast comes up through the charge, and decide whether the abnormal working be due to the hangings or not; if we find that the furnace charge fails to settle regularly, or if we notice blow-holes, then the furnace should be barred off at

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once, since we may be sure we are losing not only flue-dust, but also lead by volatilization.

We should always bear in mind, in cases where extensive flues or chambers are not provided, that we shall lose much lead in the form of fume, to which we have already directed attention; and the question arises, whether we should not lose as much or more lead by dropping the furnace down, preparatory to barring, as we should by letting the furnace run on, since we have known of several cases where, by varying the mode of feeding, these hangings could be cut off by the blast; yet where the hangings contain much zinc sulphide, it is very rare that the furnace acts in this manner.

(TO BE CONTINUED.)

Spiegeleisen Product of the United States.—The quantity produced in the United States in 1885 was 34,671 net tons, of which 19,522 tons were made in the first half of the year and 15,149 tons were made in the second half. As compared with 1884, when 33,893 tons were made, there was an increase in 1885 of only 778 tons. New Jersey and Pennsylvania were the only States making spiegeleisen in 1885, but Missouri is expected to join them this year.

Human Electrotypes—a New Use for Copper.—A new method for disposing of the human body after death has been proposed by M. Kergovatz, a chemist of Brest. His system is an antiseptic one, stated to be much simpler and less expensive than the old process of embalming, and is nothing more than a new galvanoplastic application. The body is coated with a conducting substance, such as plumbago, or is bathed with a solution of nitrate of silver, which, after decomposition under the influence of sunlight, leaves a finely divided deposit of metallic silver. It is then placed in a bath of sulphate of copper, and connected for electrolysis with several cells of a gravity or other battery of constant current. The result is, that the body is incased in a skin of copper, which prevents further change or chemical action. If desired, this may be again plated with gold or silver, according to the taste or wealth of the friends of the dead. M. Kergovatz has employed the process eleven times on human subjects and on many animals, and states that in all cases it was perfectly satisfactory.

German Production of Coal.—The *Hamburger Exporteur* states that during the last five years the output and export of pit coal have been as follows (weight kilo tons of 1000 tons) in Germany:

	Production. Kilo tons.	Export. Kilo tons.	Percentage of production.
1880	46,974	7,236	15·4
1881	48,688	7,458	15·3
1882	52,119	7,632	14·6
1883	55,943	8,705	15·6
1884	57,190	8,817	15·4
	260,914	39,848	15·3

For the export to transatlantic countries, only Rhenish-Westphalian coal comes into consideration, and even that is of little importance. As long as the present style of transport and working of the pit coal till it reaches the vessel is maintained, a profitable export to transatlantic ports is impossible. Even if the English system of working be adopted, this export has to overcome greater difficulties on account of the softness of the Westphalian steam coal. Only through the combination of considerable capital and skill can a profitable result be obtained.

A Protective Duty on Laborers.—The Belgians appear to think that if protection is good at all, the more of it they get, the better it should be. The *Colliery Guardian* says:

"Beset on all sides by powerful competitors, who protect themselves at home by import duties, the Belgians find themselves compelled to adopt similar means to save their chief industries from ruin. Several liberal free trade deputies have already announced their intention to vote in favor of protection to satisfy the wishes of their electors. An attempt will be made to carry a measure in the next session for imposing a heavy import duty on coal.

"Related to this growing desire for protective duties, and to the dreaded competition of the Germans, is the following fact, which will interest persons other than Belgian. A petition is receiving numerous signatures at Antwerp claiming the imposition of a patent duty of not less than 300 francs for the employment of foreigners. This measure is meant to check the immigration of Germans, who are invading every commercial situation."

An import duty of say $100 a head on all foreign workmen entering this country should be a popular scheme for all the anti-Chinese and anti-Irish or anti-Polack agitators. But some will be of the opinion that this is carrying protection ideas a little too far.

Production of Coal in India.—From an official statement just published on the moral and material progress of India, we note that the use of Bengal coal, which is general in that province for industrial purposes, is gradually extending throughout Northern India. Bombay continues to draw its supply from England, the freights for English coal sent out in exchange for cargoes of raw produce ruling very low. But with the extension of railroads and the reduction of freights in the coasting trade, Indian coal may, it is stated, before long compete successfully with imported coal, even in the Western Presidency. In Bengal, only three out of the numerous coal-fields known are actually worked, the principal of which is the Raniganj. There are seventy-eight collieries, and the total output was, in 1883–84, 1,200,957 tons, or more than double the output, 532,846 tons, of 1882–83. Outside Bengal, there are only two collieries, those of Mohpani and Warora, in the Central Provinces, though it is stated that workings were begun in the native State of Rewah, toward the close of the official year. An attempt to open a mine at Lakading, in Assam, has also recently failed. The Assam coal-fields, however, which have just been prospected, are considered very promising. They cover a plateau with an area of thirty square miles. The number of people engaged in mining in India is something over 23,000, but the return is admittedly inaccurate. Iron has been found in almost every district in India, and is worked with charcoal by native agency. It is expected that the growing scarcity of fuel and the competition of English iron will displace the indigenous methods by European manufacture on a large scale. This has not yet occurred. The chief native foundries are in Bengal, the Punjaub, and the Central Provinces.

Report of the Massachusetts Gas Commissioners.—The first annual report of the Gas Commissioners to the Legislature shows that there were on the 1st of January, 1885, sixty-one companies in operation, with an aggregate capital of $11,588,350, ranging from the $2,500,000 of the Boston Gas-Light Company to the $1250 of the Amesbury & Salisbury Gas-Light Company. There were, besides, gas-works at Chicopee Falls, Holyoke, Lee, Middleborough, Ware, and Webster, with an estimated aggregate value of $263,000. The fifty-nine companies making returns during the year ended December 31st, 1885, show debts amounting to $976,800. Of these companies, forty-five have an aggregate surplus over capital and debts of $2,173,967, while eleven show an aggregate deficit of $332,606. The amount invested in the sixty-seven companies in operation, therefore, is about $14,670,500, which is doubtless a low estimate. Of the eleven companies reporting a deficit, the Citizens' Steam and Gas-Light Company of Lynn returns a deficit of $125,000, which appears to have been lost in its steam-heating business: it never manufactured gas for illuminating purposes. In addition to the companies in operation, ten have been recently organized, the most important being the Consumers' and the Bay State of Boston, each with a capital of $500,000. The loss by leakage in the State shows a range of from 5 to 30 per cent. The taxes paid by the seven principal companies of the State amounted during the year to $121,717.09, as high in some cases as 20 cents per foot. The production of coke is about 1400 pounds to the ton (2240 pounds) of coal carbonized. From 25 to 50 per cent is burned in the works, the rest sells at from $2 to $3.50 a chaldron, according to the efforts of the companies to dispose of it. From 9½ to 12 gallons of tar are produced from each ton of coal. It sells from 60 cents to $2.50 a barrel of 50 gallons, depending upon the local demand. Only a few companies find it profitable to collect and store the ammoniacal liquor.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book-buyers, give the retail price!]

Statistics and Dynamics for Engineering Students. By Irving P. Church, C.E., Assistant Professor of Civil Engineering, Cornell University. New York: John Wiley & Sons. 1886. 8vo, pages iv+194, and 194 figures. (*No Index.*) $2.

The Determination of Rock-Forming Minerals. By Dr. Eugen Hussak, Privat-Docent in the University of Graz. With 103 Wood-Cuts. Authorized Translation from the First German Edition, by Erastus G. Smith, Ph.D., Professor of Chemistry and Mineralogy, Beloit College, Beloit, Wisconsin. New York: John Wiley & Sons. 1886. Sq. 8vo, pages viii+233, Bibliography, and Index. $3.

SECOND GEOLOGICAL SURVEY OF PENNSYLVANIA.

Report of Progress C5. Part I. Field Notes in Delaware County. By C. E. Hall, with a Colored Geological Map of the County, and thirty-nine Photographic Pictures of the Granite Quarries, the Kaolin Mines, the Serpentine Outcrops, and the Castle Rocks, published in advance of the Geological Report on Delaware County, Part 2, by J. P. Lesley. Harrisburg: Published by the Board of Commissioners for the Second Geological Survey. 1885. 8vo, pages xvi+128 (including Index).

Report of Progress RR. Part II. The Township Geology of Elk and Forest Counties, by Charles A. Ashburner, and of Cameron County, by Arthur W. Sheafer. Relates especially to the Geology of the Coal Measures of the Carboniferous Age. To which are appended 1. Drillings for Coal in Sergeant Township, McKean County. A Correspondence by N. F. Jones, J. P. Lesley, and C. A. Ashburner. 2. Notes on Iron Ore in Cameron County, by C. A. Ashburner. Illustrated by 30 Page Plates and 1 Map; Accompanied by an Atlas (RR) containing 11 Sheets of Maps and Sections. Harrisburg: Published by the Board of Commissioners for the Second Geological Survey. 1885. 8vo, pages xvi+405 (including Index).

Report of Progress T3. The Geology of Huntingdon County. By I. C. White and other Assistant Geologists. Edited by J. P. Lesley. Illustrated by a Colored Geological Map of the County; a Topographical Map of Part of Bald Eagle Mountain; a Topographical Map of Part of Nittany Valley; a Sheet of Coal Measure Columnar Sections; a Sheet of Palæozoic Columnar Sections; Two Heliotype Page Plates; and 64 Plate Maps and Sections. Harrisburg. Published by the Board of Commissioners for the Second Geological Survey. 1885. 8vo, pages xv+471 (including Index).

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

GRANTED JANUARY 26TH, 1885.

334,765. Combined Blasting-Barrel, Measuring-Rule, and Drill-Hole Scraper. John E. Fehn, St. Clair, Pa.
334,773. Gas-Pressure Regulator. Robert F. Hatfield, New York City.
334,774. Purifier and Feeder for Boilers. Henry F. Hayden, Washington, D. C.
334,793. Apparatus for Lifting and Controlling the Flow of Fluids. William T. Messinger, Cambridge, Mass.
334,821. Method of Manufacturing Flanged Castings. James Sullivan, Newton Upper Falls, Mass.
334,873. Clamp for Stopping Leaks and Bursts in Pipes. William W. Knight, Jersey City, New Jersey.
334,882. Stop-Valve for Gas-Supply Systems. Edwin C. Merrill, Pittsburg, Pa.
334,890. Leak-Detector for Gas. Irvin M. O'Donel, Alleghany, Pa.
334,898. Nail Feeding Mechanism. Charles D. Rogers, Providence, R. I.
334,919. Ground-Screw for Boring Wells. Samuel Wickizer, Pierre, Dak., Assignor to William C. Eickemeyer, Frank Hassler, John F. Hughes, and Harry Ernest, all of same place.
334,959. Steam-Boiler and Pipe Covering. Charles B. Manville, Milwaukee, Wis.
334,960. Apparatus for Indicating the Speed of Shafting, Machinery, etc. William B. Mason, Boston, Edwin J. Wescott, Hyde Park, and William L. Stevens, Boston, Mass.
334,961. Process of Desulphurizing Gold and Silver Ores. Joseph H. Mathews, Canton, Ohio.
334,978. Traction-Engine. Edgar Penney, Waynesborough, Pa.
335,006. Explosive Compound. Charles W. A. Zadek, Bartow-on-the-Sound, New York.
335,038. Slide and Passage for Gas-Motor Engines. Nicolaus A. Otto, Deutz on the Rhine, Germany, Assignor to the Gasmotoren Fabrik Deutz, same place.
335,041. Miner's Lamp. Henry J. Richards, Wilkes-Barre, Pa.
335,058. Electric Furnace and Method of Operating the Same. Alfred H. Cowles, Cleveland, Ohio.
335,059. Electric Furnace for Metallurgic Operations. Eugene H. Cowles and Alfred H. Cowles, Cleveland, Ohio.

FURNACE, MILL, AND FACTORY.

The Fort Scott Foundry and Machine-Works, Fort Scott, Kansas, are running a force of 100 men full-time and some extra hours. The company has many orders. Among the recent ones is a contract from the Detroit Copper Company, at Morenci, Arizona, for the erection of a concentrator of 100 tons daily capacity, for the concentration of its low-grade copper ores from the mines of the company. This plant will consist of improved pattern Blake crushers, Cornish crushing-rollers, revolving sizing-screws of perforated steel plates for the perfect sizing of the ores, and hydraulic classifiers, with double-acting jig machines and slime-jigs for the treatment of the fine slimes, making a complete, continuous, and automatic system of concentration.

It is announced authoritatively that the Grace Furnace, at Marquette, Mich., will be put in blast early next season, the necessary repairs to begin in April.

The Columbia Rolling-Mill Company's mill, at Columbia, Pa., is running full on grooved skelp and tube iron.

The Youngstown Car-Works, at Haselton, Ohio, resumed operations in all departments on the 1st inst.,

The new Clapp-Griffiths steel plant of the Western Nail Company, Belleville, Ill., which, as mentioned in our last issue, has begun operations, shows that the work done on the 28th ult. was a very decided improvement on the first seven blows; carbon running, ·07 and ·08; phosphorus, ·140; silicon, a mere trace. Steel ingots are working nicely. Every thing is now working as originally designed, giving grand results, quality of steel No. 1.

It is proposed to erect a nail mill at Minneapolis Minn.

An open-hearth furnace is to be added to the plant of the Volta Iron Company, Apollo, Armstrong County, Pa.

It is reported that money has been raised for the purpose of erecting an iron and brass foundry at Jesup, Ga.

A terrific explosion occurred on the 2d inst. at the Miami Powder-Works at Goe's station, near Xenia, Ohio, where three powder-mills were blown to atoms. Gustave Snyder, superintendent of the works, was so badly burned and bruised that he can not recover.

A license has been granted to the Garden City Iron and Steel-Works, at Chicago, Ill., for the purpose of rolling and manufacturing iron and steel rails and merchant bar, plates, angles, flats, and all kinds of work pertaining to railroads, rolling-mill, and machine-shop, foundry, and forging business; capital stock, $500,000; incorporators, John R. Moore, Frank H. Johnson, J. B. Livingston, and D. W. Wilson.

At the Joliet Steel Company's rolling-mill, Joliet, Ill., on the 29th ult., 1728 rails were rolled, with 105 minutes spare time. The day turn rolled 1658 rails, with 85 minutes to spare. During the last hour of the day turn, 185 rails were rolled. The labor of controlling the machinery doing the blooming and finishing was performed by five men. The rails were reduced directly from 14-inch ingots.

The County Council, by a majority of one, decided not to grant the request of Mr. Bartlett, of Montreal, for a bonus of $50,000 in the event of his erecting blast-furnaces in Pictou County, Nova Scotia.

The puddling department of Graff, Bennett & Co.'s Thirty-third street mill, Pittsburg, Pa., which has been idle since January 1st, started up on the 2d inst.

It is stated that Oliver Brothers & Phillips and Oliver & Roberts, the iron manufacturers, Pittsburg, Pa., who failed a year ago, and were granted an extension of three years, paid the first installment of their indebtedness this week. The amount was $300,000, an average of $1000 for every working day since the failure. The payment was made without disposing of any real estate or permanent assets of the firm.

By an explosion of gas on the 1st inst., the Sheridan furnaces, at Sheridan, Pa., were burned. The boiler-houses, stocks, trestles, hoists, fourteen cars, and engine-house were burned. Loss, about $30,000.

The Waterbury Farrel Foundry and Machine Company, Connecticut, has an order for a complete set of machinery for the first cartridge factory ever established in Canada. It is building three large nail-machines of the Capewell pattern for export.

A number of furnaces in the Mahoning Valley, Ohio, have been seriously embarrassed for lack of coal, and some of them have been banked.

A company has been formed in Pittsburg, Pa., for the purpose of making and putting on the market an automatic machine for making wire nails. The machine was invented by Mr. Lemuel Bradford, late manager for the Laughlin Nail Company, Wheeling, West Va.

The Lucy Furnace, at Pittsburg, Pa., has been closed because of the scarcity of coke.

The Pequest Iron Furnace, at Belvidere, N. J., was to have been put in blast this week.

The Roane Iron Company, it is stated, has resolved to make full tests of the Cranberry (N. C.) ores for steel making by the Bessemer process. Enough of the ore to make the test full and conclusive will be smelted at Rockwood and tried in Pittsburg converters. If the trial is a success, the company will probably enter upon the manufacture of Bessemer blooms and rails at its works at Chattanooga, Tenn. A Siemens-Martin plant is connected with the mill.

The Union Steel-Works, Chicago, Ill., will probably start up during the early part of the summer. The company is making large improvements, including a new Bessemer steel mill.

The German Society of Mechanical Engineers offers a premium of 1000 marks for the best plan for a boiler-shop in which 16 locomotive boilers can be constructed at once; also, a premium of 300 marks for an essay on the best method, according to present experience, for fastening tires on railroad rolling stock.

The Water-Supply Company, of Norway, Me., has contracted with Henry R. Worthington, of New York, for pumping-engines for the new works.

The furnaces of the Terre Haute Iron and Nail-Works, of Terre Haute, Ind., were started on the 30th ult.

The west end of the tire mill, including the scrap mill, steam and trip-hammers and new engine, of the Standard Steel-Works, at Logan, Pa., were destroyed by fire on the 4th inst. The loss is estimated at $20,000; fully insured. The works will be reconstructed.

LABOR AND WAGES.

The Clinton Iron-Works, Pittsburg, Pa., shut down in all departments on the 1st inst., including the blast-furnaces, owing to a strike for an advance of 10 per cent in wages. The wages were reduced 10 per cent last year, and the strike is to enforce a return to the old prices. The strikers number sixty men, but their refusal to work causes the suspension of operations at the mill.

All the employés of the Cambria Iron-Works, at Johnstown, Pa., except the tonnage men and miners, have received an advance in wages of from 4 to 6 per cent on the 1st inst. They asked 10, but no trouble is expected.

At a delegate convention of the coal miners of Western Pennsylvania at Pittsburg, Pa., on the 2d inst., the scale of wages presented to the operators at the recent national conference here was unanimously adopted. Delegates to the national convention of operators and miners, which is to be held at Columbus, Ohio, on the 23d inst., were also elected.

The nailers at the Somerset Iron-Works, Fall River, Mass., have been notified of a 10 per cent reduction, to take effect February 15th.

The strike in the coke regions of Pennsylvania has caused much trouble and suffering to the strikers, and is likely to cause a coke famine. A number of the companies have evicted the families of the strikers from their houses and imported other laborers into the regions. Dispatches state that some of the works have resumed operations and others deny this report. Nothing definite has so far been settled.

The State Trade Assembly at Columbus, Ohio, before adjourning, adopted a resolution favoring the enactment of an eight-hour law to be observed by corporate companies. It did not indorse the action of the National Federation Trades Union held in Chicago, proposing to strike May 1st for the eight-hour system, but recommended legislation on the subject.

It is reported from Irwin, Pa., that the Westmoreland & Penn Gas Coal companies have advanced the wages of their employés five cents a ton.

The miners of the two coal companies at Lincoln, Ill., struck for a reduction in the price of supplies—on powder from $3 a keg to $2.50, and on oil from $1 a gallon to 75 cents. The companies refused the demand.

TRANSPORTATION NOTES.

The Cresson & Clearfield Railroad, which extends from Cresson Springs station, on the Pennsylvania Central, to Irvona, Clearfield County, Pa., has been finished. This road taps some of the richest coal-fields and timber lands in the Clearfield Region. The road is intended to connect with the Beech Creek and Vanderbilt system, and complete what is known as the New York Short Line. It is understood that arrangements are making with the Pennsylvania to equip the road with rolling stock. The timber and coal on the line of the road will be shipped over the Pennsylvania Central to the Eastern and Western markets.

The report presented at the annual meeting of the Huntingdon & Broad Top Mountain Railroad and Coal Company showed that the road receipts during the year were $371,000.33, of which $191,117.67 was derived from coal, $23,907.44 from coke, $87,896.11 from merchandise, and $43,016.91 from passengers. The net earnings were $191,709.35, an increase of $15,984.82 as compared with the preceding year.

The Norfolk & Western Railroad Company's report for 1885 shows the gross earnings to have been $2,771,120.87; expenses, including taxes, $1,649,-291.68; net earnings, $1,121,829.19; showing a decrease in the earnings, as compared with 1884, of $72,465.74.

The conference of General Freight Traffic Agent Wilson, of the Pennsylvania, General Freight Agent Harriott, of the Baltimore & Ohio, and President Kimball, of the Norfolk & Western Railroad Company, did not reach an agreement in regard to the renewal of the bituminous coal pool on the 2d inst. at their meeting at Philadelphia, as was expected. The Northern lines, the Beech Creek, New York Central, and West Shore have been arranged with; but the officers of the roads still in conference with the Pennsylvania desired to consider the matter further before arriving at a conclusion. In the present pool, which expires on March 1st, the Pennsylvania has 55 per cent and the Baltimore & Ohio 45 per cent of the output. An official of the Chesapeake & Ohio Railroad Company informs the general freight traffic manager of the Pennsylvania Railroad Company that the terms for the proposed bituminous coal pool are acceptable to his company. This decision was telegraphed to the Baltimore & Ohio Railroad Company, and a reply from the latter is expected within a few days.

The Tennessee Coal, Iron and Railroad Company reports, for January, coal received directly from mines, 9705 tons; coke received directly from mines, 10,887; total transported, 20,592 tons.

The Mahanoy plane machinery of the Philadelphia & Reading Company was destroyed by fire on the 29th ult. The machinery, by far the most valuable in the State, was wholly destroyed. The plane was originally designed by Stephen Girard. It was used to transfer coal from the Shenandoah and Mahanoy Valley across Broad Mountain for more convenient access to the company's main line. Without its aid, the coal would have to be transported over the Gordon plane or around by way of Tamaqua, the increased expense of haulage adding very materially to the cost of the coal. The plane was completed in 1861, and since then has been in almost constant use.

The Chancellor at Trenton, N. J., on the 2d inst., read his opinion in the case of Vail against the Central Railroad and the Philadelphia & Reading Railroad, declaring the lease of the former company by the Reading to be null and void. The unanimous consent of the stockholders is necessary, and the complainant has not acquiesced. Another reason for putting aside the lease is the default of the Reading to pay the interest. The property of the Central is ordered to be transferred back to that company, and an accounting will probably be taken. Mr. Gowen, President of the Reading, is understood to have said the company will appeal from this decision.

COAL TRADE NOTES.

ALABAMA.

The Pennsylvania-Mobile Coal Company, at Mobile, is making arrangements for the development of its mines in Walker County, where it has 11,000 acres of coal lands. A large addition was purchased of the Alabama University lands at $12.50 an acre.

ILLINOIS.

The Taylorville Coal Company, at Taylorville, Christian County, has been granted a license to carry

on a general coal mining business; incorporators, John C. Breman, H. M. Powell, H. R. Anderson, and others.

Work in the G shaft, one of the three mines operated by the Chicago, Wilmington & Vermilion Coal Company at Braidwood, has been abandoned. Sixteen hundred tons of coal have been taken out of this shaft in one day.

IOWA.

The supply store of the Whitebreast Coal and Mining Company, at Cleveland, was burned on the 1st inst. The loss is estimated at $50,000.

PENNSYLVANIA.

ANTHRACITE.

The fire that broke out last August, in Packer Colliery No. 2, at Lost Creek, near Shenandoah, has been extinguished. It was owned by the Lehigh Valley Coal Company. The cost of subduing the fire is estimated at $50,000.

No. 4 colliery, owned by the Lehigh Coal and Navigation Company, at Lansford, has resumed operations after an idleness of one month on account of water. Its shipments average 600 tons a day.

After spending a fortune in the sinking of a shaft 550 feet deep, the Silver Brook Coal Company has, it is said, discovered at Silver Brook the Buck Mountain vein, fifteen feet thick and excellent in quality. The company will at once proceed to develop the vein and erect a large breaker.

The work of sinking the bore-hole into the fifth counter of the Ross vein of No. 1 slope, at Nanticoke, where the imprisoned miners are supposed to be, has been fairly started upon, the drilling beginning at noon on the first inst. Up to two o'clock P.M. on the 2d, the drill had passed through thirty feet. Much difficulty is encountered by reason of boulders falling from the sides of the bore-hole and interfering with the work of the drill. After the boulder stratum is passed, and the quicksand proper entered, the drillers expect better progress, and anticipate reaching the rock within sixty hours. Besides the $5000 contributed to the relief fund by the Directors of the Susquehanna Coal Company, business houses and citizens of Philadelphia have sent $537.

BITUMINOUS.

The Barclay Coal Company reports its income from rent of railroad and royalty on coal for the month of December as $6680, and for the year 1885, $90,460.

WEST VIRGINIA.

The coroner's jury in the case of the miners killed by the explosion of fire-damp in the Oriel Coal Company's mine at Newburg, on the 21st ult., rendered a verdict on the 30th ult. The jury find that the accident was caused by leaving an open door in the air passage in the mine, thereby impairing the ventilation and allowing gas to accumulate; that it was due to the failure of the superintendent to obey the instructions of the State Mine Inspector; and pronounce the penalty affixed by the Legislature of 1883 for such neglect inadequate.

GAS AND OIL NOTES.

Exports of refined, crude, and naphtha from the following ports, from January 2d to January 30th:

	1886. Gallons.	1885 Gallons.
From Boston	325,889	220,396
Philadelphia	9,049,920	3,944,930
Baltimore	398,178	439,955
New York	30,936,765	28,078,174
Total exports	40.737,752	32,638,445

KENTUCKY.

The Kentucky Natural Gas and Fuel Company of Newport has been incorporated.

NEW YORK.

Operations are to begin at Cairo and Catskill Townships, Greene County, for boring for natural gas.

The street franchise asked for by the Buffalo Natural Gas Company at Buffalo, in which the Standard Oil Company is said to be deeply interested, is strongly opposed. It is reported that the coal dealers have detailed a committee to oppose the franchise, and the Buffalo Lubricating Oil Company, which has for some years been fighting the Standard, is working hard against it.

OHIO.

The largest oil well in the Ohio field was developed on the 2d inst., at Lima, on the Moore & Brotherton territory. This well, it is thought, will exceed 150 barrels a day.

PENNSYLVANIA.

Representatives of a syndicate of Pittsburg, Philadelphia, New York, and Cleveland capitalists are at Pittsburg arranging for a pipage of natural gas from Butler County to Cleveland. The syndicate has leased 40,000 acres of gas land in Western Pennsylvania, and, it is said, has offered the Forest City Council $10,000 a year for a franchise to light and heat the city.

The People's Light and Heating Company has struck gas at the McLane well at a depth of 2070 feet. The well penetrated the Hess and fifty-foot sands without receiving any indications of gas, and drilling was continued with the intention of going to the Gordon sand for oil. The strike was made in the stray sand above the Gordon. The new well, together with the Hess No. 1, which is partially cleaned out, will supply sufficient gas to heat Washington.

The Philadelphia Natural Gas Company will soon introduce a system of meters in Pittsburg that will calculate how much gas is used. For several months, Mr. Westinghouse has been wrestling with the problem of furnishing a cheaper gas by cutting off the waste. A calculation has been made, based upon the amount of coal displaced by the gas, that about twice the gas is furnished that is really utilized. Could this waste be cut off, natural gas could be furnished at half the present rates, and still return the same profits.

An oil strike has been made in a prospecting-well on the Patterson homestead, about sixteen miles from the Washington field, at a small place known as Patterson's Mills. At a depth of 1400 feet, it is said, the drill encountered the oil sand, and the fluid made its appearance in large quantity. The owners have contracted to sink the well 2000 feet. This well opens up a new territory.

The Westmoreland & Cambria Natural Gas Company, which has a capital stock of $250,000, is perfecting its arrangements to pipe natural gas from Westmoreland County to Johnstown. It is drilling a well at Grapeville, near Greensburg, and in the event of encountering gas there, will transmit it to Johnstown, or, in the event of a failure to find it, will use the gas from the two wells belonging to J. M. Guffey, near Murrysville. The distance from Grapeville to Johnstown is thirty-four miles. The line will take in Greensburg, Latrobe, Ligonier, Minersville, Millville, Conemaugh, and Johnstown.

The new well at the Moore farm in Washington County, owned by the Chartiers Company, has come in with a strong flow of gas, equal, it is thought, to the McGuigan well. A strike of gas in a new well of the same company at Murrysville is reported. It is one of the best yet struck in that field.

The Manufacturers' Natural Gas Company, of Pittsburg, has contracted to furnish five wells in the Washington oil territory with gas for fuel purposes, as soon as it can lay the pipes and make the attachments. The company expects within a few days to bring in a large well on the farm of the Miller Brothers, northeast of Canonsburg, and to pipe it to Houstonville, and thence following the line of the Chartiers Valley road to the oil territory of the Catfish and Upper Chartiers creeks.

GENERAL MINING NEWS.

ARIZONA.

MOHAVE COUNTY.

Stevens, Osgood & Co. have completed their new gold mill in the Lost Basin District, with every thing in readiness to start up. Ore is now hauled from the Ida mine to the mill.

ARKANSAS.

Col. E. R. Moffitt, of Joplin, Mo., has been visiting the mines in the new lead district of Bear Mountain, Ark. He assisted at sinking a shaft fifty feet, with the view of erecting reduction-works if the value of the vein should be proved. According to the *Age of Steel*, he says that specimens taken at a depth of nine feet show 50 per cent of lead, and he expresses himself highly pleased with the outlook.

CALIFORNIA.

MONO COUNTY—BODIE DISTRICT.

Operations continue as usual at the different mines in this district, and the developments made show no new or important features.

NEVADA COUNTY.

NORTH BLOOMFIELD.—Judge Sawyer has granted an appeal to the Supreme Court from the decision of the United States Circuit Court, in the case of Woodruff *against* the North Bloomfield Gold Mining Company. The company was lately adjudged in contempt in permitting and carrying on hydraulic mining.

SAN BERNARDINO COUNTY.

The new gold find in ledges in Arrow Mining District, at the south end of Providence, is showing up much better than anticipated. The main ledge of the camp, which now has eleven locations on it and on which little or no work has been done, is prospecting, and a body of ore has been struck.

SAN DIEGO COUNTY.

GOOD HOPE CONSOLIDATED.—During the past year, the company has extracted from the different claims over $60,000. New machinery will be added, and, with increased facilities, the company will not only be able to crush a largely increased quantity of quartz from its own mines, but will be prepared to do considerable custom work.

SANTA CLARA COUNTY.

QUICKSILVER MINING COMPANY.—The company has issued the following statement of earnings and expenses from January 1st, 1871, to December 31st 1885:

EARNINGS.

Quicksilver produced	299,822 flasks	
Average value	$35·1204	$10,529,851
Miscellaneous		599,521
Total		$11,129,372

EXPENSES.

Pay-rol's	$4,747,932	
Miscellaneous and taxes	678,687	
Materials consumed in operations of mine and furnaces	1,513,017	
		6 939,637
Profit balance		$4,189,735

The balance is accounted for as follows:

Expended for improvements and repairs	$885,354
Real estate purchased, legal expenses, and patents, "black debt" of 1870	62,312
Increase in personal property accounts in California and consignments abroad	147,523
Funded debts and dividends paid in New York	2,434,142
Interest on funded debt, taxes, legal expenses, etc	660,102
	$4,189,735

The company now has neither funded nor floating debt.

The dividends paid during the period were as follows: $9.25 on 42,913 shares preferred, $2.25 on 57,087 shares common, August 4th, 1881, $525,391; $6 on preferred stock, 40 cents on common stock, May 3d, 1882, $280,312; $3 on preferred stock, February 26th, 1884, $128,739; total, $934,443.

SIERRA COUNTY.

PIONEER.—In the case of the Pioneer Gold Mining Company *vs.* B. F. Baker, which was referred to Master in Chancery Houghton, to take an accounting upon a mortage, a report has been made to the United States Circuit Court that finds that there is still due upon the mortgage $74,194.48. The mine in question is located at Grass Flat.

COLORADO.

CLEAR CREEK COUNTY.

CENTRAL BULLION.—Judgment was given in the County Court at Georgetown on the 30th ult., in the sum of $1552.79 in favor of William O. Farland *et al.*, against the Central Bullion Company.

COLORADO UNITED.—The company proposes to dispose of some of the western portion of the property to another company in which the members of the Colorado United will receive a substantial share interest. It is stated that the company owns an amount of ground far in excess of that which can be worked with the capital at its disposal. A meeting for the purpose of considering this question was to be held in London on the 3d inst.

SILVER GLANCE.—By the new agreement with the contractors, 240 feet are to be sunk for $9600, and the contractor is to drive seven forty-foot adits in the same shaft, the first adit to begin 75 feet from the surface and the remainder at equal distances from each other.

GILPIN COUNTY.

ADELAIDE.—A new pool has been formed in Nevadaville, and work has begun on this property.

LAKE COUNTY.

The publication of the statements of Leadville smelters and ore-shipments that we give below has been delayed, owing to snow-bound mails. The statements have been published in the Leadville *Herald-Democrat*, and the statistics have been collected by Mr. A. F

Wuensch, who is well known as a careful and able statistician :

PRODUCTION OF THE LEADVILLE SMELTERS AND MILLS DURING THE YEAR 1885.

NAME OF WORKS.	Tons of lead.	Ounces of silver.	Oz. of gold.	Value.
American Smelting-Works	5,170¼	1,066 132	4,323	$1.628 976
Arkansas Valley Smelter	4,227½	855,745	1,515	1,270,623
Harrison Reduction-Works	3,111	9 6,275	624	1,303,479
La Plata Smelting-Works	4,354½	1,751,898	572	2,213,763
Manville (Elgin) Smelter	1,882½	378,520	9 50	484,772
Fryer Hill Smelter	382	57,000	268	96,533
Antioch Gold Quartz Mill	.....	.....	1,750	35,000
Oro Gold Quartz Mill	.....	.....	1,550	31,000
Lillian Gold and Silver Mill	.....	.....	750	15,000
Chrysolite Silver Mill	.....	30,808	.....	32,656
Total	19,127¾	5,130,079	12,312	$7,190,410

STATEMENT OF ORE-SHIPMENTS.

Report of Ore Produced by Leadville Mines during 1885, *and shipped to smelters at Pueblo, Denver, Cañon City, Salt Lake City, Durango, Golden, Kansas City, and Argo*

Source of Ore.	Gross tons	Contents. Oz. silver.	Contents. Oz. gold.
Holden Sampling-Works	34,740½	1,311,915	20,195
Arkansas Valley Sampler	19,328½	515,187	1,595
American Smelter	3 000	35,000	.....
Hensley & Follett	15,385	147,722	.....
W. L. Thompson	6 086	221,832	.....
Colonel Sellers	4,553½	176,562	.....
Forepaugh Mine	4,490	179 989	.....
Lee Basin and Denver City	3,786	79,447	.....
Robert E Lee	3,500	42,000	.....
Minnie and A. Y. Mines	2,290½	104,856	.....
Mike & Starr Mine	130	1,950	.....
Evening Star Mine	6 160	73,920	.....
Morning Star Con. Mine	9,260	111.120	.....
Chrysolite Silver Mine	4,291	91 614	.....
Miscellaneous	6,000	91,400	.....
Twin Lakes Placers	.....	.....	2,050
California Gulch Placers	.....	.....	600
Total	132,001	3,184,514	24,440

Source of Ore.	Contents in lead, tons.	Value
Holden Sampling-Works	8,746	$2,483,815
Arkansas Valley Sampler	5,767¾	1,032,440
American Smelter	62	42,041
Hensley & Follett	Iron ore.	156,585
W. L. Thompson	665½	286,795
Colonel Sellers	1,008½	266,626
Forepaugh Mine	.....	190,788
Lee Basin and Denver City	Iron ore.	84,214
Robert E. Lee	Iron ore.	44 520
Minnie and A. Y. Mines	545¼	154.100
Mike & Starr Mine	Some copper.	3,107
Evening Star Mine	Iron ore.	77,455
Morning Star Con. Mine	Iron ore.	117,787
Chrysolite Silver Mine	156¾	109,463
Miscellaneous	20	99.016
Twin Lakes Placers	.....	41,000
California Gulch Placers	.....	12,000
Total	16.971¾	$5.167.252

Silver is calculated at $1.06 an ounce; lead, at $78.80 a ton; and gold at $20 an ounce, being the average prices of the metal per year.

The output of Leadville this year, compared with last, calculating the contents of the ore shipped out of the camp, shows a falling off in the yield of lead of 22,284 tons. An increase is shown in the silver product of the district of 1,235,642 ounces, and a gain in the yield of gold of 14,126 ounces. In 1884, silver averaged $1.10 an ounce, and in 1885 only $1.06. This depreciation of silver during the year just passed resulted in a loss to the mines of Leadville of $332,583, and also reduces the value of the Leadville output a corresponding amount. As compared with 1882, the value of the output of Leadville is reduced over half a million dollars on account of the reduced price of silver. In the calculation of lead, compared with previous years, Leadville also suffers heavily on account of the decline of this metal. But for the reduced price of silver, the value of the yield of Lake County would this year be about the same as last.

The following table shows the production of each metal and the tons of ore shipped from Leadville to other points for treatment since 1877 :

YEAR.	Tons of lead.	Ounces of silver.	Ounces of gold.	Tons of ore.
1877	175	376,827	2,750	3.300
1878	2.324	450,476	897	15.840
1879	17.650	6,004,416	1,100	18,540
1880	33,551	8,999.399	1,688	12.410
1881	38.101	7,162,909	13,182	15.639
1882	43.124	7,273,249	16,413	90,102
1883	36,570	5.313,638	25,169	160,890
1884	35,296	5,720.904	27,617	112.805
1885	19,127	5,130,079	12,312	132,001
Total	226.118	46,431,887	101,137	561,527

The Leadville *Herald-Democrat* reports the following :

CARBONATE HILL CONSOLIDATED.—Some time ago, the property of this company was sold under judgment and purchased by Mr. George W. Bittenger for $1700. The time of redemption expires on the 8d inst., and it is understood that a few of the principal stockholders contemplate redeeming the property in the name of one of their number. The company owes about $7000 in addition to the judgment of $1700.

DENVER CITY.—Judge Goddard, in the District Court, on the 31st ult., decided the case of W. W. Flagg against the Denver City Mining Company, in favor of the latter. The suit was for a quarter interest in the Denver City lode.

MORNING STAR.—On the 25th ult., fifty-two tons of ore were settled for, which was extracted from the McHarg shaft. The mineral ran 52 ounces in silver and 64·6 per cent in lead. This is the first lot of ore shipped from this mine in several years past.

SMALL HOPES.—The output of this group of mines in January is estimated at 1800 tons. A new shaft has been started on this property in the northwest corner of the Forest City lode. The main workings in the Forest City mine continue looking well and disclose extensive resources.

STRAY HORSE GULCH.—The company has leased its property, the Rarus lode. A new shaft will be sunk at once.

SUMMIT COUNTY.

LINCOLN.—The Messrs. Churchill have sold their interest in this stamp mill to Mr. Frederick Smith, who has begun operations. The mill is of fifteen-ton capacity.

WARRIOR'S MARK.—James Fryer's interest in this mine has been sold at sheriff's sale for $4771, subject to other liens and attachments.

DAKOTA.

LAWRENCE COUNTY.

CALEDONIA.—The production for the last half of January, as by official advices, has been 825 ounces of gold, valued at $13,612.50.

INDIANA.

LAWRENCE COUNTY.

A bed of kaolin, ranging in depth from six to twelve feet, has been discovered in this county, and the analysis proves it to be of the best quality.

MEXICO.

The Mexican *Financier* reports the following :

It is reported from Pachuca that several of the largest mining companies are thinking of shutting down until the State of Hidalgo repeals the recently enacted tax of two per cent on exports of silver. The original tax on exportation was levied for the purpose of building a railroad; but now that that work has been accomplished, miners do not see any good reason for keeping the tax up. There is likely to be an animated controversy over this matter.

EL CARMEN.—This mine, in Chiapas, belonging to Mr. Zacarias Espodda, is operated under the management of an American, Mr. Arthur Gray.

REAL DEL MONTE.—An active demand is found for the shares, at $750 bid, $1000 asked. The Porvenir, belonging to this company, is doing well.

RINCON FRIJOLAR.—Mr. Modesto Espinosa will hereafter work this mine in Chiapas on a better method than heretofore.

SANTA GERTRUDIS.—Owing to the lack of dividends, the shares have dropped to $400.

MICHIGAN.

COPPER MINES.

PEWABIC.—The company has appealed from the decision of Justice Mathews in the Mason suit.

TAMARACK.—The mine is producing regularly, and the rock hoisted to the surface shows a high grade, or one above the average, says the Houghton *Mining Gazette*. Last week, rock was raised from the third and fifth levels, and from the bottom of the mine. Saturday, nearly 130 cars or skips were brought to the surface, and 24 cars of rock, averaging over 12 tons each, were sent to mill, where two heads are employed in stamping it. An admirable and economical feature at the mine is the facilities for handling the output. The rock-breakers are under the same roof with the shaft outlet, and as the cars are run from the cage, their contents are dumped on screens, by which means the handling of fully one third of the rock is avoided, the screenings falling to the rock-bins below, passing from there to the cars through the usual chutes. Such rock as passes over the screens is shoveled or passed by hand to the rock-breakers, from three to six feet distant, thus doing away with all wheeling or unnecessary handling.

IRON MINES.

On summing up, we find, says the Marquette *Mining Journal*, that the output of iron ore from the mines of the Lake Superior region in 1884 exceeded the product in 1885 by a considerably larger amount than the excess in favor of the former year, as it was estimated at the close of navigation last season, and before the full returns were obtainable. The total output in 1884, including that of the Vermilion mines in Minnesota, was 2,518,048 gross tons. With the addition of the newly opened Gogebic mines, in 1885, it was but 2,427,437 gross tons, the difference in favor of 1884 being 90,611 tons.

CALEDONIA.—Operations have been resumed at this property at Crystal Falls.

KEEL RIDGE.—A company is to be organized with a capital of $500,000 to prosecute work on this property. Explorations have been making for some time, and the results have been so encouraging, it is said, as to warrant the forming of a company. An assessment of $1 a share has been levied for working capital, and suitable machinery will be put in at once for pumping out the old mine and for sinking upon the ore revealed by the new pits. The following analysis of the ore taken from the test-pits shows it to be of good quality : Metallic iron, 65½ per cent; phosphorus, from ·010 to ·015; silica, ·02½.

WEST CHAPIN.—A new shaft has been sunk about 200 feet north of the old workings. It has been dropped 57 feet, and a drift to the north shows red slates and lean formation similar in character to that found at the old shaft.

MINNESOTA.

MINNESOTA IRON COMPANY.—About 800 men are worked in and about the mines of this company, in the Vermilion District, and more will be taken toward spring. The new Ingersoll air-compressor at the Ely mine is in position and running. It drives three drills at the Ely and two at the Stone, but has capacity for seven more when these are needed.

MONTANA.

JEFFERSON COUNTY.

HELENA MINING AND REDUCTION COMPANY.—Official advices show the production for 1885 to have been as follows :

Gold. Ounces.	Silver. Ounces.	Lead. Pounds.	Copper Pounds.
9,220	601,362	6,928,039	10,433

SILVER BOW COUNTY.

The following are extracts from the Utah & Northern Railroad Company's statement for 1885, together with a comparison with the previous year's business :

RECEIPTS.

RECEIVED.	1885.	1884.	Increase.	Decr'se.
NATURE OF SHIPMENT.	Tons.	Tons.	Tons.	Tons.
Lumber and shingles	28,706¼	29,955 4-5	1,750 9-20	.....
Coal	24,448 3-10	7,3.5 1-10	17,083 1-5	.....
Wood	14,024 1-5	2,4.6 3-5	12 137 3-5	.....
Salt	10,732 5-6	9,238 1-3	1,494½	.....
Coke	5,746 1-3	2,602 4-5	3,143 8-15	.....
Hardware, iron, nails, etc	2,635 4-5	2,737 7-10	.....	101 3-10
Machinery and castings	1,670 2-5	850	820 2-5	.....
Cement, plaster, etc	1,211 3-10	767	444 3-10	.....
Silver ore	29	26½	2½	.....
Steel rails, etc	23½	96 1 3	.....	72 5-6
Bullion and lead	¼	3 1-7	.....	2 25-28

SHIPMENTS.

Copper ore	239.122	73,627	165,495	.....
Matte	14,008½	13,209	799½	.....
Lumber and shingles	1,084½	633½	448	.....
Silver ore	831	.....	831	.....
Hardware, etc	320¾	518¾	.....	198¾
Machinery, etc	217 7-10	47 1-7	170½	.....
Coal	158 7-10	13	145 7-10	.....
Salt	95	30 4-5	64 1-5	.....
Cement, plaster, and lime	55	¼	54¾	.....
Steel, etc	16	3 1-10	12 9-10	.....

NEVADA.

STOREY COUNTY—COMSTOCK LODE.

From reports by the Virginia City *Chronicle*, we take the following :

The Golden Gate concentrator set up at the Brunswick mill is said to be giving general satisfaction, and the management are about to order five more to take the entire pulp resulting from the daily crushings of the 56 stamps. Last week, the concentrates from 147 tons of ore were amalgamated in one pan in twelve hours. Under the old process, it is necessary to run 16 pans twenty-four hours to amalgamate that amount of unconcentrated ore crushings.

BEST & BELCHER AND GOULD & CURRY.—Steam

was turned into the cylinders of the pump-engine on the surface at the Osbiston shaft on the 25th ult. The donkey-pumps were started on the 26th ult. at the water-level, and have cleared the second line of pumps below the Sutro tunnel level. It will require until March 1st to drain it to the bottom or 2500 level.

CONSOLIDATED CALIFORNIA & VIRGINIA.—During the week ended January 22d, 734 tons of ore were extracted from above the 1750 level and shipped to the Morgan mill, giving an average assay value of $15.44 a ton. During the same period, 1498 tons were extracted from above the 1500 level and shipped to the Eureka mill. The average value of this ore, according to assays from battery samples, was $15.21 a ton. During the week, bullion valued at $52,077.60 by assay was shipped to San Francisco. A rumor is current that Senator Jones, who has a contract for milling ore above the 1550-foot level, at $6 a ton, has ordered concentrators for the Eureka 60-stamp mill. It is said that by concentrating, the cost of crushing and amalgamating will not exceed 50 cents a ton.

HALE & NORCROSS.—The lightning winze is down 80 feet below the floor of the station on the 3100 level. The bottom is in vein-matter carrying a percentage of mineralized quartz, and is perfectly dry.

NEW MEXICO.

GRANT COUNTY.

ATLANTIC.—The ore now extracted from this mine at Piños Altos is taken from the 175-foot level, the deepest working in the camp, and is much richer than that nearer the surface.

FLAGLER REDUCTION-WORKS.—The works began running on the 25th ult., on about thirty tons of ore. If this run proves as successful as is anticipated, the crushing machinery will be shut down until every thing can be put in complete working order. A large new furnace for roasting ores will be added, and such improvements and additions made as will make the plant thoroughly complete in every particular. When this is done, these works will begin the regular purchase and working of ore. This will take some little time, and until then the works will continue treating the Bremen tailings.

INCOME.—This company has sold its half-interest in the Sherman mine, near Silver City, to S. Herbert Howe, for $6000.

PEACOCK.—The force has been largely increased, and the mill put in operation. Some new machinery will be added for crushing the tailings, and things generally are getting into shape for continuous working.

ROSE.—A shaft-house, boarding-house, and other buildings are going up. As soon as the new hoisting machinery arrives, it will be put in place, and sinking the shaft 300 or 400 feet deeper will begin. When this is done, stoping will begin from the bottom, the ore will be hoisted, and the waste will be allowed to fall to the bottom of the workings; considerable saving in getting out the ore will thus be effected. A car-load of ore is extracted from the red ledge at a depth of 150 feet, the bottom of the present shaft.

SIERRA COUNTY.

Walter C. Hadley, John B. Miller, and C. H. Russell, have been appointed a committee to receive the new lixiviation-works at the mines of the Sierra Grande, Sierra Apache, and Sierra Bella mining companies, at Lake Valley. It is said that the works are obliged to make a continuous and successful run for ten days before they will be received by the company.

OHIO.

ROSS COUNTY.

The discovery of silver is reported, and arrangements are making for sinking a shaft on the property.

PENNSYLVANIA.

CUMBERLAND COUNTY.

The Philadelphia & Reading Coal and Iron Company is preparing to resume operations at its ore mines at Boiling Springs. The mines have been idle five years.

UTAH.

WASHINGTON COUNTY.

CHRISTY.—According to reports, Mr. Alexander Del Mar has examined this property for a London syndicate, with the view of purchasing.

STORMONT.—Work has been resumed in the main incline below six in the Buckeye & Savage it having stopped for a short time for the purpose of widening the shaft. This was done to prospect the ledge, which was found to be much wider than the shaft. A streak of high-grade black ore has been uncovered. The other parts of the mine show up well. Thirty tons of ore were shipped from the Thompson during the week ended the 16th ult.

WISCONSIN.

BAYFIELD COUNTY.

BAYFIELD SILVER AND COPPER MINE.—This mine, which has been in course of development for the past two years, under many drawbacks and discouragements, is beginning to show up. The vein-matter that has been taken out of the working-shaft during the past three months has been rich in copper ore and native copper, intermixed with more or less native silver. The working shaft, No. 4, is down 46 feet. The company is working a double crew, day and night shift, with the windlass and bucket; but at the recent meeting of the directors, held in Ashland, it was decided to at once put in an engine and machinery, and increase the working force. As a result of the success of this mine, it is stated that another company has been organized and work begun in the immediate vicinity.

WASHINGTON COUNTY.

A report has been circulated about the alleged discovery of diamond-fields in the township of Wayne, about forty miles north of Milwaukee. Recently, an opaque pebble, somewhat larger than a walnut, was picked up in a gravel-bank. It was brought to Milwaukee and placed in the hands of a diamond expert, who, after the usual tests, pronounced it a 22-carat diamond. It is shaped like a pear, smoky in color, and is the largest diamond ever found in Wisconsin. Several years ago, a fifteen-carat stone was found at Eagle, Waukesha County, thirty miles west of Milwaukee. A general impression that the mine was "salted" prevented it from being worked. The fact that the two localities are in the same general range leads experienced diamond miners to believe in the possibility of mining to advantage in the vicinity. The rough diamond is worth $225.

WYOMING.

From the annual message of the Governor, Francis E. Warren, we take the following:

While this territory has many and varied resources, none contains greater promise for the future than its undeveloped mineral possessions. Very much has been accomplished since the adjournment of the last Legislature in the way of prospecting and partial development, and the work done in this direction demonstrates that Wyoming will, at no distant day, become more noted for her mineral production than for any of her industries.

Coal was largely and profitably mined before our territorial organization, and since; but the development of other minerals may be said to have scarcely begun. Nevertheless enough has been learned to establish the fact that we have mountains of iron, copper, mica, and sulphur, vast lakes of soda, immense tracts of coal and petroleum, together with the precious metals, and many of the baser metals not here enumerated. Increased railroad facilities will do much for our mining interests, and favorable legislation can greatly aid them. There should be a sufficient sum appropriated to continue the encouragement of this important industry. Your attention is also called to the necessity of providing by law suitable protection for miners against dangers arising from improper legislation, insufficient timbering, want of escape-shafts, and other accidents incident to mining under ground.

MARKETS.

Silver.

NEW YORK, Friday Evening, Feb. 5.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
Jan. 30	46¾	102¼	Feb 3	46½	101¾
Feb. 1	46¾	102¾	4	46½	101¾
2	46¾	102¼	5	46 9-16	101¾

There was a considerable fall in silver in London during the early part of the week, owing to lower rates for India exchange and an increased offering of bills by the Indian Council on Wednesday last, from which there has been but a slight reaction in London on an advance in the interest rate of the Bank of Bengal. Our market continues nominal and weak at rates of accompanying table.

The French government has appointed a permanent commission to examine into questions in relation to the monetary standard at home and abroad.

United States Assay-Office at New York.—Statement of business for the month ended January 30th, 1886:

Deposits of Gold.

Foreign coin	$47,000	
Foreign bullion	148,000	
United States bullion	367,000	
United States bullion (re-deposits)	142,000	
Jewelers' bars	219,000	
Refined gold	250,000	$1,173,000

Deposits of Silver.

Jewelers' bars	$24,000	
Foreign coin	3,700	
Foreign bullion	60,000	
United States bullion (contained in gold)	7,800	
United States bullion, re-deposits	3,000	
Dakota	20,500	
Lake Superior	2,500	
Montana	123,000	
Nevada	10,000	
New Mexico	21,000	
Refined silver	125,500	401,000
Total deposits		$1,574,000
Gold bars stamped	$1,430,499	
Silver bars stamped	413,749	1,844,248

United States Mints.—The total coinage of the mints during January amounted in value to $6,269,470. The number of standard silver dollars turned out was 2,600,000.

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate of discount, and it remains at 3 per cent. During the week, the bank gained £173,490 bullion; and the proportion of its reserve to its liabilities was raised from 43⅝ to 45⅛, against 46¼ per cent at this date last year. The weekly statement of the Bank of France shows gains of 2,997,000 francs gold and 2,219,000 francs silver.

Copper.—This market is extremely quiet in all the metals, and copper is said to have weakened a little on account of special rates of freight obtained by the Baltimore Works. We continue to quote Lake 11½c.; Orford and Baltimore, 10¼@10⅜c.

Nothing has yet been done with regard to renewing foreign contracts for Lake copper, though it is understood the foreigners are very anxious to do so. It is supposed that the continued low quotations for copper, which have now ruled for some time in London, are due in part at least to efforts to secure Lake at low prices. There is nothing in the statistical position of the metal to justify our producers in sacrificing this metal. On the contrary, it is pretty generally believed that, by holding back their copper for a month or two, and possibly by some common action in selling, the price of copper can very easily be advanced one or two cents a pound here. The consumption in this country has grown so enormously, as shown in the full statistics we published last week, that our exports can be lighter than heretofore, and the stoppage of shipments would quickly bring about an advance in London.

The London market is quoted a little higher to-day, Chili closing at £40 5s., and Best Selected £44.

We hear that the electrolytic method of refining is not considered a commercial success here, and that the quality of the European electrolytic copper has declined during the past year, and is no longer so highly esteemed as it was. Possibly this decline in quality may be due to forcing the precipitating to reduce cost.

Tin.—This metal has advanced in London from £91 15s., as quoted a week ago, to £92 10s. for spot and £93 5s. for three months. Here we quote 20·50 @20⅝c.

Shipments from the Straits to the United States during the first eleven months of 1885 are reported at 37,058 piculs, against 55,279 in 1884; 100,231 in 1883; 104,395 in 1882; 76,522 in 1881; and 137,615 in 1880.

Lead.—With the exception of a few car-loads sold at 4⅝c., there have been no transactions in this market during the week. The market is firm but very quiet, and may be quoted at 4·65@4⅝c. Cable advices quote soft Spanish £12 5s., English, £12 15s.

We quote Sheet-Lead 7@7¼c. Lead pipe, 6@6½c.; Shot, 6@7c.

Messrs. Everett & Post, of Chicago, telegraph to us as follows to-day:

Market firm, with upward tendency. Sales, 400 tons Refined, spot and future, 4·40c. Offerings very light.

Messrs. John Wahl & Co., of St. Louis, telegraph to us as follows to-day:

The market during the past week has worn a more

cheerful aspect than for some time past, and sales will foot up no less than 300 tons Common lead at prices ranging from 4·30@4·35c.; 600 tons Corroding at prices ranging from 4·35@4·40c. at the close. Holders are stiff, and will not sell under top figures named, with good prospects for further large sales during ensuing week.

Spelter.—There is no change in this metal, which drags along. We quote 4·35@4·60c. for Domestic, according to quality; 6¼@6½c. for New Jersey, and 4·95@5c. for Foreign.

In London, Silesian is quoted £15, as a week ago.

Sheet-Zinc is quoted 5@5¼c. for Domestic.

Antimony.—The London market, as cabled to the Metal Exchange, quotes Hallett's £35, a decline of 10s. during the week. We quote here Hallett's 9c., Cookson's 9½c.

Nickel.—We quote nominally at 70c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Feb. 5.

American Pig.—The market, though firm, is very quiet. We hear from other cities of an improved feeling, but here there is at present no sign of any advance in prices. The Thomas Iron Company is practically out of the market, having disposed of 130,000 tons. Prices are firm at $18@$18.50 for No. 1 X, $17@$17.50 for No. 2 X, and $16@$17 for Forge, for best Lehigh and North River brands, the higher figures being obtained for special brands.

Scotch Pig.—But little business is done in this article. We quote: Coltness, $21; Summerlee, $21; Glengarnock, $20@$20.50; Dalmellington, $19; Eglinton, $18.50.

Cable advices to-day quote Scotch irons lower, warrants being 39s. 2d.; we believe the lowest figure in thirty years. Coltness, 46s.; Langloan, 45s.; Summerlee, 48s.; Gartsherrie, 44s.; Glengarnock, 44s.; Dalmellington, 42s.; Eglinton, 39s. 6d. Freights are 7s. 6d.@10s.

Bessemer Pig.—Quotations are nominal at $19@$19.50. There is no pressure to purchase, and prices are inclined downward, though nominally unchanged.

The prospect, reported this evening, of a break in the strike of the coke-makers will relieve the market of any anxiety as to the supply of Bessemer iron, and if some of the Western furnaces making so-called Bessemer iron were to stop, it might improve the reputation of the rails from some Western mills.

Spiegleisen.—The market is quiet, and we quote English 20 per cent at $27@$28, and German at $27.

Steel Rails.—At the meeting in Philadelphia, yesterday, of the Board of Control of the steel rail mills, it was decided not to increase the quota until orders for 800,000 tons have been booked, after which the quota is to be increased to 1,150,000 tons, or very nearly the full rail capacity of the mills. The capacity of the mills is estimated at 1,500,000, of which 1,200,000 tons are rails. At the end of January, the orders booked were reported at 723,000 tons, and they are now said to aggregate nearly 770,000; sales of about 32,000 tons having been reported here during the week.

Prices may be quoted $34 at Eastern mills, $35 at Cambria and Pittsburg, and $38 at Chicago, but small lots still have to pay $35 in some cases. There is no desire on the part of the mills to increase prices; nor is there any possibility of lowering them when most of the mills have their order-books so well filled. For in addition to the 723,000 tons reported at the end of January, a very considerable amount of last year's orders have still to be filled.

It is said there was some "very plain talk" at the meeting of the Board of Control concerning the alleged poor quality of some rails made at some of the Western mills. Unquestionably, there has been ground for the complaint, and it is to be hoped that wiser counsels will prevail, and that quality rather than quantity will be made the principal aim of each of our American works, that the bad name that inferior work has gained for our American rails in some cases may not be allowed to cast a slur over the entire industry, as foreign makers are only too anxious to have it.

We shall return to this subject on another occasion.

Structural Iron and Steel.—Prices are firm. Angles, 1·90@2c. delivered; Tees, 2¼c.; Iron Beams and Channels, 3c. for American; and Belgian, 2·60@2·75c.; Steel Angles, 2@2·50c.

Plate Iron.—We quote at 2@2½c., according to quality; Common Tank, 2c.; Refined, 2¼c.; Flange iron, 3¼@3½c.

Bar Iron.—The price is unchanged. We quote at 1·55@1·60c. for Common; 1·85@1·90c. Refined, for delivery in large lots. Store prices are 0·15@0·20c. higher.

Steel Plates.—We quote 2½c. for Tank; 3@3¼c. for Boiler and Ship Plates; 3½@4c. for Flanges.

Merchant Steel.—We continue to quote American Tool Steel 8@10c.; special qualities, 12@15c.; Crucible Machinery, 4½@5½c.; Bessemer Machinery, 2¼@2½c.

Old Rails.—We quote $21@$22 for Tees and $22.50 for Double-Heads. The English rails that came in recently are still in store.

Old Steel Rails are quoted at $19.

Scrap-Iron—$21@$22 for Selected Scrap.

Philadelphia. Feb. 4.

[From our Special Correspondent.]

Pig-Iron.—The past week has been decidedly against activity in business. The general situation in Eastern Pennsylvania, in regard to pig-iron, is about this: No one is anxious to go after buyers. Buyers are anxious to secure supplies, but are apprehensive that their efforts to do so will create a flutter among the birds; hence, they are gunning very quietly and cautiously. Offers were made, yesterday and to-day, for 1000 ton lots of forge iron; $16 is the highest price offered, and $16.50 is wanted. Makers of forge iron predict that they will be selling their stock at $17 within a short time. It was stated by high authorities in the trade, about two months ago, that forge iron would move at $18 by April 1st, and there are people here who firmly believe it, some of them being makers of forge iron. As to the probabilities of such an advance, there are opinions on both sides that are entitled to credit; as to the facts, they all point to a higher range of prices, because of the number and importance of the inquiries coming in, and the fact that a great many buyers are still very nearly out of stocks, or only think that they will need a great deal of iron, and are anxious to get it. Foundry iron is selling as low as $16, and as high as $18 for No. 2. No. 2 iron has been under better inquiry during the past thirty days than for a long time past, and it is pretty well cleaned up, especially for the higher grades; hence, the advance to $18 in asking prices. No. 1 Foundry has been going at about $19 in some cases; some has sold at $18, and $20 is the price held to by two or three makers who do not want to sell. The whole situation is encouraging, so far as the pig-iron industry is concerned. Both makers and buyers have been studying statistics, and to good purpose.

Foreign Material.—In the absence of statements as to reliable transactions of magnitude, quotations can only be given. Bessemer is $19@$20; Speigeleisen, $28@$28.50 for 20 per cent; nothing higher has been negotiated for of late. American Bessemer is $17@$18 at furnaces. There is considerable inquiry for foreign material, but buyers are hesitating, for some reason or other.

Muck-Bars.—Quotations are $29.50@$30, with but moderate business.

Merchant Iron.—The effect of the meeting of manufacturers some time ago is shown in the general determination among them not to cut each other's throats. Prices are firm, and at mill are quoted at 1·55@1·90 for iron, according to quality.

Nails.—Our nail-makers are looking forward with a great deal of interest to the meeting to take place on the 10th inst. A large attendance is looked for, in view of the importance of the object of the meeting. The way things look in the West, and the way buyers are talking, induce all to think that nails can be held at higher prices than are now ruling, when the spring demand sets in. Nails have been selling in a small way at $2.50, but it is rumored that considerably less has been taken for car-load lots.

Wrought-Iron Pipe.—Discounts are unchanged. A moderate amount of business is coming in.

Merchant Steel.—Merchant steel makers have booked a considerable amount of business during the past week, and have been getting stronger prices.

Sheet-Iron.—Some contracts for galvanized iron have been placed, and there are more in sight. Card rates are unchanged.

Plate Iron.—Only a moderate business in plate iron has been done; but to compensate for the existing dullness, prospects for a big business next month are very favorable. Tank is 2c.; Skelp, 1·80@1·85c.; Plates, 2@2·10c.; but it is said that these figures would all be shaded, if a large buyer would make offers just now.

Structural Iron.—Prices are 3c. for Girders, 2c. for Angles; asking prices for angles and tees are heavily shaded. Not very much business has come in during the past week, but manufacturers are far from being discouraged.

Steel Rails.—Quotations to-day are given at $34.50 @$36, according to size of order. No sales are known of at $34, although they may have taken place. It was stated to-day on the street, that inquiries for 50,000 tons, from Western and Southern roads, had been received. Inquiries for large amounts are known to have been made, but it is impossible to say to what amount. A good many orders for rails are placed for lumber and mining roads. The Bethlehem Company has advanced wages 10 per cent, and the Johnstown, from 4 to 6 per cent; other mills will probably soon pull up a little. The scarcity of coke is felt in this market, and is likely to be felt worse, as, to all appearances, the strike will be prolonged.

Old Rails.—Old rails are very scarce, and prices are likely to change any hour. Nominal quotations are $22.50 for spot lots, although brokers say they could readily get better prices for all they could offer. American rails are held as high as $24. Old Steel Rails, $20.

Scrap.—Scrap iron is very firm for No. 1.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 5.

Statistics.

Production Anthracite Coal for week ended January 30th, and year from January 1st:

TONS OF 2240 LBS.	1886. Week.	1886. Year.	1885. Week.	1885. Year.
P. & Read. RR. Co..	241,084	697,447	14,011	532,716
L. V. RR. Co.....	137,449	442,746	22,827	319,507
D. L. & W. RR. Co.	132,837	477,592	50,121	239,064
D. & H. Canal Co..	99,670	354,057	35,052	198,683
Penna. RR.:				
N. & West Br. RR.	42,498	106,438	†	80,444
S. H. & W. B. RR.	4,025	10 920	†	6,659
P. & N. Y. RR....	11,580	40,633	6.314	31,135
Penna. Coal Co....	22,991	83,338	8,089	60,743
Shamokin Div., N. C. RR.....	24,219	67,078	14,308	59,903
Lykens Valley.....	*10,000	37,265	9,418	39,325
Total...	726,353	2.317,514	160,140	1,568,179
Increase..	... ...	749,335	....	.....
Decrease.	566,213	.....	....	.....

* Estimated.

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1881.....	1,819,921	1883.....	2,106,329
1882.....	2,100,480	1884.....	1,884,875

Production Bituminous Coal for week ended January 30th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1886. Week.	1886. Year.	1885. Week.	1885. Year.
Phila. & Erie RR...	.....	129	.....	.....
*Cumberland, Md..	42,939	158,013	.....	112,875
*Barclay, Pa.....	3,112	13,181	.....	16,372
*Broad Top, Pa.				
H. & Broad Top RR.	7,100	20,082	.....	8,634
East Broad Top....	.....	.....	.....	.....
Clearfield Region, Pa.				
Snow Shoe.....	3,063	11,629	.....	15,866
Karthaus (Keating)	2,500	8,716	.....	3.221
Tyrone & Clearfield	72,762	201,285	.....	210,995
Alleghany Region, Pa.				
Gallitzin & Mountain.....	18,858	41,049	... ..	35,268
Total..... ..150,334		454,084	.....	403,235

* Tons of 2240 lbs.

WESTERN SHIPMENTS.‡

Pittsburg Region, Pa.				
West Penn RR.....	5,592	19,307	.....	20,265
SouthwestPenn.RR.	3,257	7,494	.....	7,951
Pennsylvania RR...	6,040	18,318	.....	13,068
Westmoreland Region, Pa.				
Pennsylvania RR...	30,930	100,331	.....	88,385
Monongahela Region, Pa.				
Pennsylvania RR...	4,162	12,693	.....	14,127
Total.....	49,981	158,143	... ..	143,796
Grand total.....	200,315	612,227	.....	547,031

† Reports for the week ended January 31st, 1885, were not published at the time.

‡ Considerable gas-coal shipped East, of which no division is made in report.

The Norfolk & Western Railroad Company reports the shipments of Pocahontas Flat-Top coal for the week ended January 30th, 1886, and year from January 1st as follows, tons of 2000 pounds: 1886—Week, 17,366; year,

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.			Dividends. Total paid to date.	Dividends. Date and amount per share of last.		
1	Adams, s. L.	Colo.	$1,500,000	150,000	$10	*	.....	.....	.....	$315,000	Jan	1886	.10
2	Alice, s. C.	Mont	10,000,000	400,000	25	*	.....	.....	.....	675,000	Dec.	18 5	.06¼
3	Amie Con., s. L.	Colo	5,0 0,000	500,000	10	*	.....	.....	.....	330,000	Oct	1883	.0
4	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	320,000	Jan.	1886	$1.00
5	Argent, s.	Nev	10,000,000	100,000	100	295,000	July	1885	.10	40,000	Feb.	880	.20
6	Barbee & Walker, s.	Utah	1,000,0 0	00,000	10	*	.....	.....	.....	60,000	No	1880	.10
7	Bassick, G. S.	Colo.	10,000,000	100,000	10	*	.....	.....	.....	400,000	Mar.	1884	1.00
8	Belle Isle, s.	Nev.	10,000,000	100,000	100	130,000	Dec.	1885	.10	300,000	Dec.	1879	.25
9	Belcher, G. S.	Nev..	10,4 0,000	104,400	100	2,217,345	ec.	18 5	30	15,337,000	Apl.	1876	1.0
10	Bell evue Idaho, s. L.	Idah.	1,250,000	12 ,000	10	26,250	Dec.	1885	10	87,5 0	Dec.	1845	.1
11	Big B'nd Hydraulic, G.	Dak.	1,000,000	200,000	5	*	.....	.....	.....	144,000	May	1885	.03
12	Black Bear, G.	Cal..	3,000,000	3 ,000	100	22,500	Dec.	1884	.2	895,000	May	1843	.20
13	Bodie Con., G. S.	al..	10,000,000	00,000	100	274,990	Dec.	1883	.5	1,602,572	Apl.	1885	.50
14	Bonanza Developm't	C & M	3,000,000	300,000	10	.....	.....	.....	.....	135,000	Oct.	882	.15
15	Bonanza K'g, Cons. s.	Cal..	1,000,00	100, 00	10	*	.....	.....	.....	185,000	Feb.	1885	.10
16	Boston & Mont, G.	Mont	2, 0 ,000	200,000	10	*	.....	.....	.....	87,000	Jan.	886	.15
17	Breece, s.	Colo.	5,000,000	200,0 0	25	*	.....	.....	.....	2,000	Feb.	1880	.01
18	Bullw r, G.	Cal	1,000,000	100,000	100	40,000	Oct.	1885	20	175,000	Jan.	1884	.10
19	Caledonia, G.	Dak	1,000,000	100,000	100	505,000	May	1885	.15	30,000	Jan	1886	.10
20	Calumet & Hecla, C.	Mich	2,5 0, 00	100,00	25	.....	.....	.....	.....	27,350, 00	Jan.	1886	5.00
21	Carbonate Hill, s. L.	Colo	2,000,000	200,000	10	*	.....	.....	.....	8 ,0 0	Apl.	1884	.05
22	Carbou Con., s.	Colo	1,5 0,0 0	15 ,000	10	*	.....	.....	.....	50,000	Mch	1880	.10
23	Castle Creek, G.	Utah.	100 0 0	100,000	1	.....	.....	.....	.....	51,000	Oct.	1883	.03
24	Catalpa, s. L.	Colo	3,000,000	300,000	10	*	.....	.....	.....	270,000	May	1884	.10
25	Central, C.	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,730,00	Jan.	1886	2.00
26	Chrysty, s.	Utah	10,000,000	100,000	100	.....	.....	.....	.....	10,000	Jun.	1885	.10
27	Chrysolite, s. L.	Colo	10,000,000	200,000	50	*	.....	.....	.....	1,65 ,000	Dec.	1884	.25
28	Colorado Central, s. L.	Colo.	3,000,000	300,000	10	*	.....	.....	.....	75,000	Feb.	1886	.05
29	Cons Cal. & Va., G. S.	Nev..	21,600,000	216,000	100	108,000	Jan.	1885	.20	64,800	Feb.	1880	.3
30	Con Gold Mining, G.	Ga...	500,000	1 0,000	5	.....	.....	.....	.....	108,000	Nov.	1888	.02
31	Contention, s.	Ariz.	12,500,000	250,0 0	50	.....	.....	.....	.....	+2,587, 00	Dec.	1884	.25
32	Crescent, s. L. G.	Utah	15,000,000	600,000	25	*	.....	.....	.....	180,000	Sept	1885	03
33	Crown Point, G. S.	Nev.	40,000,000	100,000	100	2,675,000	Feb.	1882	.25	11,588,000	Jan.	1875	2.00
34	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	.....	.....	.....	.....	§900,000	Jan.	1884	.10
35	Derbec B. Grav., G. S.	Cal..	10,000,000	10 ,000	100	90,000	Dec.	1881	.10	100,000	Dec.	1885	.10
36	Dunkin, s. L.	Colo.	5,000,000	200,0 0	25	*	.....	.....	.....	22 ,000	Sep	1884	.05
37	Elchorn, G. S.	Mont	1,000,000	100,000	10	50,000	July	1883	.50	90,0 0	Dec.	1885	.50
38	Eureka Con., G. S. L.	Nev.	5,000,0 0	50,000	100	400,00	Dec	1885	1.00	4,817,5 0	July	1882	.25
39	Evening Star, s. L.	Colo	50 ,0 0	50, 00	10	*	.....	.....	.....	1,400,00	Nov	1883	.50
40	Excelsior G.	Cal..	10,000,000	130,0 0	00	563,000	Sept	1885	1 00	875,0 0	Oct.	1880	.25
41	Father de Smet, G.	Dak.	10,000, 00	100 00	1 0	2 0,000	Nov	1878	1.00	1,125,000	Dec	1885	.20
42	Franklin, C.	Mich	1,000,000	40,00	25	220,000	Jun	1871	....	480,0 0	Dec.	1885	1.00
43	Freeland, G. S. C.	Colo	5,0 0,000	200,000	25	*	.....	.....	.....	150,000	Jan	1888	.10
44	Fresno Enterprise, G.	Cal..	5,000,00	100,000	50	.....	Mch	1883	.10	110, 00	July	1882	.10
45	Gould & Curry, G. S.	Nev	10,800,000	108,000	100	3,903,800	Dec	1885	.25	3,826,0 0	Oct	187	10.00
46	Grand Central, s.	Ariz.	1,000,000	10 ,000	10	.....	.....	.....	.....	625,000	Dec	1882	.25
47	Grand Prize, s.	Nev.	10,0 0,000	100,00	100	530, 00	Nov	1884	.30	495,000	Mar.	188	.25
48	Granite, s.	Colo	125,000	25,000	1	.....	.....	.....	.....	6,250	May	1883	.01
49	Granite Mountain, s.	Mont	10,000,000	100,000	25	.....	.....	.....	.....	720,000	Feb.	1886	.2
50	Green Mounta n, G.	Ca...	1,25 ,00	125, 0	10	*	.....	.....	.....	212,0 0	Nov.	1881	.07½
51	Hale & Norcross, G. S.	Nev..	11,2 0,000	112,000	100	4,762,00	Dec.	1885	.50	1,594,000	Apl.	1871	5.00
52	Hall-Anderson, G.	N. S.	150,00	150,000	1	.....	.....	.....	.....	7,000	Jan.	1885	.05
53	Hecla Con., s. G. L.	Mont	1,5 0,000	30,000	50	.....	.....	.....	.....	957,5 0	Feb.	1885	.50
54	Hel'a Mg & Red, G. S. L.	Mont	3,315, 00	663,000	5	*	.....	.....	.....	154,25	Jan.	1886	.03
55	Holyoke, G.	Idah.	2 0,000	200,000	1	.....	.....	.....	.....	27,000	Feb.	1883	.10
56	Homestake, G.	Dak.	12,5 0,0 0	125,000	100	200,900	July	1878	1.00	3,16 ,750	Jan.	1886	.40
57	Honorine, s. L.	Utah	5 0,000	250,000	2	25,000	Jun	1883	....	62,500	Nov.	1885	.05
58	Hope, s.	Mont	400,00	8,000	50	*	.....	.....	.....	158,252	Oct.	1884	1.50
59	Horn-Silver, s. L.	Utah	10,000,000	400,00	25	*	.....	.....	.....	4,000,000	Nov	1884	.50
60	Idaho, G.	Cal..	310,000	3,10	100	.....	.....	.....	.....	3,89 ,800	D c	1885	7.50
61	Independence, s.	Nev..	1 ,000,000	100,00	10	320,000	Aug.	1885	.20	225,000	Se t	1879	.25
62	Indian Queen, s.	Nev..	250,000	25,000	2	.....	.....	.....	.....	363,750	July	1883	03
63	Inyo, G.	Cal..	500,000	100,00	5	*	.....	.....	.....	45,000	Apl.	1 82	.05
64	Iron-Silver, s. L.	Colo.	10,000, 00	500,00	20	*	.....	.....	.....	1,50 ,000	Dec.	1885	20
65	Jackson, G. S.	ev.	5,000, 00	50,000	100	10,000	Nov.	1880	.20	30,000	Jan.	1885	.10
66	Jesuistita, s.	Mex.	2,500,000	250,000	10	.....	.....	.....	.....	1,25 ,000	Feb.	1885	.5
67	Kentuck	Nev..	3,00 , 00	30,000	100	342,000	Nov	1881	.30	1,350,000	July	1884	.10
68	La Plata, s. L.	Colo.	2, 0,000	20 , 00	10	*	.....	.....	.....	610,000	Sept	1882	.30
69	Leadville Cons., s. L.	Colo	4, 0,000	400,000	10	*	.....	.....	.....	370,000	July	1 85	.05
70	Lexington, G. S.	Mont	4,000,0 0	40,000	10	*	.....	.....	.....	53 ,000	Jan	1885	2.00
71	Little Chief, s. L.	Colo	1 ,000,0	2 0,000	50	*	.....	.....	.....	780,0 0	Mch	1880	.10
72	Little Pittsburg, s. L.	Colo.	20, 00,0 0	200,000	10	*	.....	.....	.....	1,050, 00	Mch	1881	.50
73	Manhattan, s.	Nev.	5,000,000	50,000	100	150,000	July	1879	1.00	437,500	Feb	1886	.25
74	Marguerite, G.	Cal.	500, 0	25,000	2	.....	.....	.....	.....	18 ,0	Oct.	882	.25
75	Martin White, s.	Nev.	10,000,00	100,000	100	1,125,00	Aug.	1885	25	90,000	July	1879	30
76	Mon ana, Lt., G. S.	Mont	3,3 0,000	33 ,000	10	*	.....	.....	.....	178,2 0	Oct.	1885	.27
77	Morning Star, s. L.	Colo.	1,000,000	100,000	10	.....	.....	.....	.....	55,000	Sept	1885	.25
78	Mulvane, s. G.	Mont	2,000,000	400,000	5	*	.....	.....	.....	23,000	Dec	1885	.07½
79	Mount Pleasant, G.	Cal.	150,000	150,000	1	*	.....	.....	.....	105 000	Mar.	1 84	.10
80	Mt. Diablo, s.	Nev	5,000,0 0	50,000	100	137,500	Jun.	1883	2.00	80,000	July	1885	.20
81	Napa, G.	Cal..	700,000	100,000	7	.....	.....	.....	.....	200,000	Jan.	1883	.10
82	Navajo, G. S.	Nev..	10,0 0,000	100,000	100	370,000	Jan.	1886	30	325,000	Feb	1885	.25
83	N. Belcher Hill, G. S.	N. C	3 0,000	120,00	2½	*	.....	.....	.....	3 ,0 0	Dec.	1885	03½
84	New York Hill, G.	Cal	5,0 0,00	50,000	100	62,500	Oct	1883	.15	215,000	Aug	1882	.10
85	New York & Colo., G.	Colo	1,00 ,000	500,0 0	20	*	.....	.....	.....	25,000	July	1879	.10
86	Northern Belle, s.	Nev.	5,0 0,000	50,000	100	425,000	Jan	1884	8.50	2,400,000	Apl.	1883	.50
87	North Belle Isle, s.	Nev.	10,0 0,000	100,000	100	130,000	Dec	1885	.15	3 ,0 0	Aug.	1881	.15
88	Ontario, s. L.	Utah	15,000,00	150,000	100	.....	.....	.....	.....	7,100,000	Jan	1886	.50
89	Opnir, G. S.	Nev..	10,00 ,00	100,000	10	3,932,800	Feb.	1886	3	1,595,000	July	1882	1.00
90	Original, s. C.	Mont	1,5 0,000	60,000	25	*	.....	.....	.....	114 0 0	Oct.	1884	.06
91	Osceola, C.	Mich	1,250,0 0	50,000	25	480,000	Apl.	1876	1.60	972,500	Sept	1884	25
92	Oxford, G.	N. S.	125,0 0	125,00	1	*	.....	.....	.....	34,5 0	Oct.	18 5	.03
93	Paradise Valley, G. S.	Nev.	10, 00,000	100,000	100	47,000	Mar.	1882	.15	50,000	Oct.	1 84	.10
94	Pleasant Valley, G. S.	Cal.	10, 00,0	100,000	100	40,000	Mar	1884	.10	30,0 0	Dec.	1882	.05
95	Plymouth Con., G.	Cal..	5, 00,000	100, 00	50	*	.....	.....	.....	1,575 000	Feb	1885	.25
96	Prussian, s. L.	Colo	1,500,00	50,000	10	.....	.....	.....	.....	1 2,000	Jan	1885	.10
97	Quicksilver, pref., Q.	Cal..	4,3 0,0 0	43,00	100	.....	.....	.....	.....	731,4 0	Feb.	1886	1.50
98	" com., Q.	Cal	5,700,0 0	57,000	100	.....	.....	.....	.....	151,00	July	1885	.40
99	Quincy, C.	Mich	1,000,00	40,000	25	200,000	Dec.	1862	.....	3,100,000	Jan.	1886	4.00
100	Ricamond, s. L.	Nev..	1,350,000	54,000	25	*	.....	.....	.....	3,109,887	Dec.	1885	1. 25
101	Rising Sun, s.	Dak.	750,0 0	150,000	5	*	.....	.....	.....	52,000	May	1881	.07½
102	Robinson Con., s. L.	Colo.	10, 0 ,000	200,000	50	*	.....	.....	.....	585,000	Mar.	1886	.05
103	Robert E. Lee, s. L.	Colo.	10,000, 00	500,000	20	*	.....	.....	.....	100,000	Dec.	1882	.10
104	Rooks, G.	Vt...	500,000	50,000	10	*	.....	.....	.....	61,000	Apr	1885	.30
105	San Francisco, C.	Cal.	5, 0,000	50,0 0	100	45,000	Sept	188	.50	2 ,0 0	Feb.	1885	.05
106	Savage, s.	Nev..	11,2 ,000	112,0 0	100	6,100,000	Jan.	1886	.50	4,480,000	July	1859	3.00
107	Security L. Mg, Mfg.	Colo.	1,00 ,000	100, 00	10	*	.....	.....	.....	5 ,000	July	1884	.....
108	Shoshone, G.	Idah	15 ,000	150, 0	1	.....	.....	.....	.....	7,5 0	Apl.	1888	.01
109	Sierra Buttes, G.	Cal..	225,000	22,500	10	.....	.....	.....	.....	1,400,614	Oct.	1885	.12½
110	Sierra Bella, s.	N. M	1,00 ,000	200,0 0	5	.....	.....	.....	.....	30,0 0	May	1884	.15
111	Sierra Grande, s.	N. M	2,000, 00	400,00	5	.....	.....	.....	.....	880,000	Sept	1884	.25
112	Sierra Nevada, G. S.	Nev..	10, 0,000	100,000	100	5,922,695	Jan.	1886	.25	102,000	Jan.	1871	1.00
113	Silver Cord, G. S. L.	Colo.	5,0 0,000	500,0 0	10	.....	.....	.....	.....	225,000	Nov.	1883	.25
114	Silver King, s.	Ariz.	10,000, 0	1 0,0 0	100	.....	.....	.....	.....	1,575,000	Jan	1885	.25
115	Silverton, G. S. L.	Colo.	2, 00,000	200,0 0	10	*	.....	.....	.....	36,000	Jan.	1886	.02
116	Small Hopes, Cons., s.	Colo.	5,00 ,000	250,0 0	20	*	.....	.....	.....	1,837,500	Jan.	1885	.20
117	Smuggler, s. L.	Colo.	60,000	6 ,000	10	.....	.....	.....	.....	66,700	Aug.	1881	.25¾
118	Socorro, C.	N. M.	253,000	2,500	100	.....	.....	.....	.....	4,000	Mch	1882	.00
119	South Yuba, G.	Cal..	2,0 0,000	40,0 0	50	*	.....	.....	.....	150,0 0	Oct.	1881	.75
120	Spring Valley, G.	Cal..	2 0,0 0	2 0,000	1	*	.....	.....	.....	250,0 0	Jan.	1881	.25
121	Stanford, G. S.	Cal..	10 00,00	100,0 0	100	25,000	Oct.	1884	.25	4,425,000	Mar.	1884	.25
122	Stormont, s.	Utah	5 0,0 0	50, 00	1	*	.....	.....	.....	15 ,000	Nov.	1884	.05
123	St. Joseph, L.	Mo..	1,1 0,00	110,000	10	*	.....	.....	.....	49 ,0 0	Dec.	1885	4.20
124	Syndicate, G.	Cal..	10, 00,000	100,000	100	33,729	July	1882	.15	48,3 8	Sept	1885	.10
125	Tip Top, s.	Ariz	10,000,000	100,0 0	100	250,000	Sept	1883	.25	100,0	Nov.	1881	.20
126	Tombstone, G. S. L.	Ariz	12,500,0 0	50 ,000	25	*	.....	.....	.....	1,250,000	Apl.	1884	.10
127	True Fissure, G. S. L.	Utah	1,00 ,000	150,000	10	*	.....	.....	.....	75,000	Jun.	1883	.15
128	United Gregory, G.	Colo.	3 0,000	300,000	1	.....	.....	.....	.....	42 000	Apl.	1883	.25
129	United Verde, C.	Ariz	3,000,000	300,0 0	10	*	.....	.....	.....	97,500	Feb.	1884	.2
130	Valencia, M.	N. H.	150,000	1,500	100	*	.....	.....	.....	37,5 0	Dec	1885	5.00
131	Vizina, s.	Ariz.	5,000,000	200,000	25	*	.....	.....	.....	14 ,000	Apl.	1882	.10
132	Yellow Jacket, G. S.	Nev.	12, 0,0 0	12 ,000	100	5,443,000	Dec.	1885	75	2,184,000	Aug.	1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.		
1	Agassiz Cons., s. L.	Colo.	$2,500,000	50,000	$50	*	.....	.....	.....
2	Albion, s. L.	Nev.	15,000,000	150,000	100	$577,000	July	1883	.50
3	Allouez, C.	Mich	2,000,000	80,000	25	240,000	Feb.	1884	.50
4	Alpha Con., G. S.	Nev..	3,000,00	30,000	100	415,000	Jan.	1885	.50
5	Alta, s.	Nev.	10,08 ,000	100,800	100	1,951,400	Jan.	1886	25
6	American Flag, s.	Colo	1,250,000	125,000	10	300,000	Jun.	1877	.25
7	Barcelona, G.	Nev..	5,000,000	200,000	25	*	.....	.....	.....
8	Battle Creek, G.	Dak.	5,000,000	200,000	25	.....	.....	.....	.....
9	Bear Creek.	Cal.	300,000	300,000	1	.....	.....	.....	.....
10	Bechtel Con., G.	Cal..	10,000,000	100,000	100	173,500	n.	1883	.10
11	Belvidere.	Cal.	.....	60,000	.....	92,000	b.	1882	.15
12	Belmont, s.	Nev	5,000,000	50,000	100	730,00	Feb.	18 5	.15
13	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	1,647,790	Jan	1886	.50
14	Big Pittsburg, s. L.	Colo.	20,000,000	200,0 0	100	*	.....	.....	.....
15	Black Jack, G.	Cal..	250,000	100,000	2½	*	.....	.....	.....
16	Bonanza Chief	Mon	1,000,000	1,000,000	1	*	.....	.....	.....
17	Bondholder.	Colo	5 0,000	200,000	2½	.....	.....	.....	.....
18	Boston Con., G.	Cal..	10,000,0 0	100,000	100	170,000	Nov	1883	.25
19	Bradshaw, s.	Ariz	2,25 ,000	22 ,000	10	.....	.....	.....	.....
20	Buckeye.	olo.	2,000,000	400,000	5	*	.....	.....	.....
21	" preferred.	Colo.	.....	.....	.....	*	.....	.....	.....
22	Bull Domingo, s. L.	Colo	10,000,000	200,000	50	*	.....	.....	.....
23	Bullion, G. S.	Nev	10,000,0 0	100,000	100	4,570,000	July	1885	.25
24	Bye and Bye.	Ariz.	1,000,000	100,000	10	*	.....	.....	.....
25	Calaveras, G.	Cal..	500,000	500,000	1	*	.....	.....	.....
26	Cal. W'r & M. Co., G.	Cal.	.....	.....	.....	.....	.....	.....	.....
27	Castle Creek, G.	Idah.	.....	.....	.....	.....	.....	.....	.....
28	Catskill, s.	Nev..	1,500,000	30,000	5	.....	.....	.....	.....
29	Central Arizona, s.	Ariz.	10,000,000	100,00	100	.....	.....	.....	.....
30	Cherokee, G.	Cal..	1,500,000	15 ,000	10	.....	.....	.....	.....
31	Chollar, s.	Nev..	11,20 ,0 0	112,000	100	928,000	Dec.	1885	.50
32	Climax, s. L.	Colo.	2,000,000	200,000	10	*	.....	.....	.....
33	Colorado No. 2, s. L.	Colo.	100,000	10,000	10	.....	.....	.....	.....
34	Con. Imperial, G. S.	Nev..	50,000,000	500,0 0	100	1,050,000	May	1885	10
35	Con. Pacific, G.	Cal..	6,000,000	6 ,000	100	165,000	Aug	1885	.15
36	** Cop. Queen Cons, C.	Ariz	1,400 00	140,0 0	10	.....	.....	.....	.....
37	Crescent, s. L.	Ariz.	3,0 0,000	30 ,000	10	*	.....	.....	.....
38	Crocker, s.	Ariz	10,000,000	100,000	100	25,000	Oct.	1884	.25
39	Crowell, G.	N. C	5 0,000	5 0,000	1	.....	.....	.....	.....
40	Dahlonega, G.	Ga...	250,0 0	250,000	1	*	.....	.....	.....
41	Dardanelles, G.	Cal..	1,000,000	100,000	10	*	.....	.....	.....
42	Decatur, s.	Colo.	1,5 0,000	300,000	5	*	.....	.....	.....
43	Denver City, s. L.	Colo.	5,000 0 0	500,000	10	*	.....	.....	.....
44	Denver Gold.	Colo.	300,000	6 ,000	5	.....	.....	.....	.....
45	Deseret, G. S.	Utah	500,000	50, 00	10	*	.....	.....	.....
46	Dunderberg, s.	Colo	1,500,000	150,000	10	*	.....	.....	.....
47	Durango, G.	Colo	500,000	500,000	1	*	.....	.....	.....
48	Eas ern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	840,000	May	1885	.10
49	Elko Con., s.	Nev..	.....	.....	.....	.....	Mar	1884	.15
50	Empire, s.	Utah	10,000,000	100,000	100	.....	.....	.....	.....
51	Enterprise, s. L.	Colo	800,0 0	80,000	10	*	.....	.....	.....
52	Eureka Tunnel, s. L.	e...	10,000,000	1 0,000	100	*	.....	.....	.....
53	Exchequer.	Nev.	10,000,000	1 ,000,000	100	840,000	Aug	1885	.90
54	Globe Copper.	Ariz	.....	.....	.....	.....	.....	.....	.....
55	Gold Placer, G.	Colo.	5,000,0 0	200,000	25	*	.....	.....	.....
56	Goodshaw, G.	Cal..	10,000,000	10 ,000	100	229,314	Dec.	1885	.25
57	Grand Belt, C.	Te..	12,000,0 0	120,000	100	*	.....	.....	.....
58	Granville, G.	N. C.	300,0 0	300,000	1	*	.....	.....	.....
59	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	.....	.....	.....	.....
60	Harlem M. & M. Co., G.	Cal..	1,000,000	200,000	5	.....	.....	.....	.....
61	Head Cent. & Tr. s. G.	Ariz.	10,000,00	100,000	100	.....	.....	.....	.....
62	Hidalgo, s.	Mex	200,00	20,000	10	.....	.....	.....	.....
63	Hortense, s.	Colo.	2,000,00	20 ,000	10	.....	.....	.....	.....
64	J. D. Reymert.	Ariz	10,000,000	10,000	100	*	.....	.....	.....
65	Julia Cons., G. S.	Nev..	11,000,000	110,000	100	1,438,000	Nov	1885	.10
66	Lacrosse, G.	Colo.	1 ,00 ,00	100,000	10	*	.....	.....	.....
67	Lee Basin, s. L.	Colo.	5 ,00,000	500,000	10	*	.....	.....	.....
68	Leviathan, s.	Nev..	10,000,000	100,000	100	380,000	Sept	1882	25
69	Lucerne, s.	Colo.	5,000,000	500,000	10	*	.....	.....	.....
70	Mammoth Bar., G.	Cal..	10,000,000	100,000	100	50,000	Jan.	1885	.10
71	Mariposa pref., G.	Cal..	5,000,000	50,000	100	1,687,500	Dec.	1881	.25
72	" common, G.	Cal..	10,000,000	100,000	100	1,975, 00	Feb	1883	.25
73	May Belle, G.	Cal..	10,000,000	100,000	100	84,000	Dec	1881	.20
74	Mayflower, s.	Cal..	1 0 0,000	100,000	100	60,000	Mar	1884	.15
75	Mexican, G. S.	Nev	10,000,000	100,800	100	2,515,360	Sept	1885	.25
76	Michoacan Synd.	Mex.	.....	.....	.....	*	.....	.....	.....
77	Mine & Starr, s. L.	Colo	1,00 ,000	200,0 0	5	*	.....	.....	.....
78	Miner Boy, G. S. L.	Colo.	5,0 0,000	500,000	10	*	.....	.....	.....
79	Miller.	Nev	5,000,000	200,000	25	.....	.....	.....	.....
80	Mono, G.	Cal	5,000,000	5 ,000	100	560,000	Jun.	1885	.50
81	Moose Silver, s.	Colo.	3,0 0,000	300,000	10	*	.....	.....	.....
82	New Pittsburg, s. L.	Colo	2,000, 00	200,000	10	*	.....	.....	.....
83	North Standard, G.	Cal..	10,000,000	100,0 0	100	20,000	Nov	.....	.....
84	Noonday.	.....	600,000	60,000	10	208,000	Dec.	1881	.10
85	Old Dominion, C.	Ariz.	3,000,000	300,00	10	.....	.....	.....	.....
86	Oriental.	Nev	2,000,000	200,000	10	.....	.....	.....	.....
87	Oriental & Miller, s.	Nev..	10,000,000	400,000	25	.....	.....	.....	.....
88	Overman, G. S.	Nev..	11,520,000	115,200	100	3,685,040	Apl.	1885	.30
89	Parrott, C.	Mon.	1,800,000	180,000	10	.....	.....	.....	.....
90	Park, s.	Utah	2,0 0,000	200,000	10	.....	.....	.....	.....
91	Peer, s.	Ariz.	10,0 0,000	100,000	1 0	115,000	Jan.	1886	.10
92	Peerless, s.	Ariz.	1 ,000,000	1 0,000	100	200,000	Jan.	1886	.20
93	Plutus, G. C. & L.	Colo	2,000,0 0	200,000	10	*	.....	.....	.....
94	Potosi.	Nev..	10,200,0 0	112,000	100	944,00	Dec.	1885	.30
95	Rappahannock, G. S.	Va..	250,000	250,000	1	*	.....	.....	.....
96	Red Elephant, s.	Colo	50,000	500,000	1	*	.....	.....	.....
97	Retort al. & M. Co.	Colo.

NEW YORK MINING STOCKS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.												SALES.
	Jan. 30.		Feb. 1.		Feb. 2		Feb. 3.		Feb. 4.		Feb. 5.		
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon..	....	.....	.....	.....	1.75	1.70	1.75	.....	.....	.....	1.70	....	590
Annie Con., Co.	.....	....	.....	.....	.05	....	.....	.....	.....	.....	.....	.....	200
Argenta	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
Bassick, Co.	.14	.....	.....	.....	.15	....	.13	.12	.....	.....	.....	.....	900
Belle Isle, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bodie Cons., Ca.	1.75	.....	.....	....	1.75	.....	1.70	.....	1.70	....	1.65	....	1.500
Breece	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
Bulwer, Ca.	.50	.48	.....	.....	.48	.43	.....	.....	.48	....	.....	.....	2,200
Cal.. B. H.	.....	.....	2.15	2.10	2.0	.....	2.00	....	2.10	2.00	2.00	1.95	1,750
Challar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Central	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.25	.....	100
Cons. Cal. & Va., Ne.	1.95	.....	.....	....	2.3	2.05	2.7	2.6	.....	....	2.70	2.60	6,48
Crown Point	.....	.....	.....	.....	.28	....	.....	.....	.....	.....	.....	.....	10
Dunkin, Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eureka Cons., Ne.	2.40	.....	.....	.....	2.30	....	2.25	..	.....	...	.....	.....	780
Father de Smet, Dk.	.....	.....	3.0	.....	..	..	3.00	.....	3.00	....	3.00	2.75	1,065
Freeland	.....	.....	.....	.....	.....	..	1.75	.....	1.75	.....	1.80	1.75	400
Gold Stripe, Ca.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gould & Curry, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Prize, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Green Mountain, Ca.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hale & Norcross, Ne.	2.65	.....	2.75	.....	2 60	.....	2 65	2.50	2 65	.....	2.25	.....	1,050
Hall-Anderson, N. S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Homestake, DK.	21.75	.....	.....	.....	.....	.....	.....	.....	22.00	.....	.....	.....	55
Horn-Silver, Ut.	3.50	.....	3.60	3.50	.....	.....	3 55	.....	3.50	.....	.....	.....	1,400
Independence, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Silver, Co.	2.35	.....	2.36	....	.....	.....	.....	.....	.....	.....	.....	.....	700
Leadville C., Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Chief, Co.	.31	.30	.....	.....	.....	.....	.3	....	.30	..	.30	....	3,200
Little Pittsburg, Co.	.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500
Martin White, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moulton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Navajo, Ne.	.....	.....	.....	.....	.42	.10	.....	.....	.....	.....	.....	.....	200
North Belle Isle, Ne.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ontario, Ut	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....
Ophir	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Osceola	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plymouth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quicksilver Pref., Ca.	.....	.....	.....	.....	.....	.....	22.00	.....	.....	.....	.....	.....	100
" Com., Ca.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quincy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Robinson Cons., Co.	1.00	.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	250
Savage, Ne.	1.25	.....	.....	.....	.....	.....	1.25	.....	.....	.....	1.25	.....	9 0
Sierra Nevada, Ne.	.....	.....	.....	.....	.70	.....	.70	.....	.70	.....	.....	.....	1,450
Silver King, Ar.	6 50	.....	.....	.....	6 25	.....	.....	.....	.....	.....	.....	.....	210
Spring Valley, Ca.	.70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Standard, Ca.	.....	.....	.....	.....	1.15	1.10	.....	.....	.....	.....	.....	.....	200
Stormont, Ut.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tip Top, Ar.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yellow Jacket	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.												SALES.
	Jan. 30.		Feb. 1.		Feb. 2.		Feb. 3.		Feb. 4		Feb. 5.		
	H.	L.	H	L.	H.	L.	H	L.	H	L.	H.	L.	
Albion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alta	.17	....	.....	.....	.....	.....	.17	....	.....	.....	.19	.....	5,600
American Flag	.09	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4 0
Barcelona, G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bechtel Con., G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belvidere	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belcher	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & Belcher, S. S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Big Pittsburg, S. L.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bowman Silver	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bull-Domingo, S.L.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central Ariz'na, S.	.08	....	.09	.....	09	....	.10	.....	.09	....	.11	.10	1,000
Challar	.....	.....	.....	.....	.....	.....	.....	.....	1.00	.....	.....	.....	200
Cons. Imperial	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pacific	.....	.....	.....	.....	.30	.....	.....	.....	.....	.....	.....	.....	100
Cusi	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Decatur	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eastern Oregon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Goodshaw, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Harlem M. & M. Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Harshaw	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kossuth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lacrosse, G.	.....	.....	.....	.....	.....	.12	.11	.....	.....	.12	.....	.12	5,000
Mariposa Pref., G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Com., G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexican, G. S.	.....	.....	.....	.....	4.25	.....	.....	.....	4.00	.....	.....	.....	650
Mono	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Pittsburg	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Standard, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Horn-Silv'r, S L.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pri'nt'l & Miller, S	.....	.....	.09	.....	.09	.....	.....	.....	.....	.....	.....	.....	600
Plutus	3 10	.....	3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	500
Potosi	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, G	.....	.....	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000
Red Elephant, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ridge	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Cliff, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sonora Con.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Bodie, G.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Bulwer, G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Hite	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Pacific	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State Line, 1 & 4, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Nos. 2 & 3, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel	.18	....	.18	.....	.18	....	.18	....	.19	.18	.....	.....	4,500
Tamarack	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tioga	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unadilla, S.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union Cons., G.	.....	.....	.....	.....	.48	.....	.....	.....	.60	.....	.....	.....	500
Utah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Dividend shares sold, 26,297. Non-dividend shares sold, 20,050.

67,626. 1885—Week, 11,336; year, 36,515. Increase 1886—Week, 6030; year, 31,111.

Production of Coke on line of Pennsylvania RR. for week ended January 30th, and year from January 1st:

Tons of 2000 pounds.

	1886.		1885.	
	Week.	Year.	Week.	Year.
Allegnany Region.	5,512	14,955	3.496	13,961
West Penn. RR.	2 296	7,290	155	437
Southwest Penn. RR	17 614	139,773	25,862	110,903
Penn. & W. Region	7,851	21,960	4,582	18,134
Monongahela	21	5,132	1,013	4,908
Pittsburg Region.	.....	.....	.....	.....
Snow Shoe	838	2,982	271	1,551
Total	34,102	192,032	35,379	149,894

Anthracite.

Early in the week, it looked as though the cut made in prices by the Pennsylvania Coal Company last week would pass unnoticed by the other companies. In fact, they agreed that such should be the case, but the Delaware & Hudson Canal Company soon came to the conclusion that it was folly to attempt to maintain prices in a market where so much coal was offered at as low, and even lower, prices than the Pennsylvania Coal Company had named, and it broke its arrangement with the other companies. This brought all prices of companies coal down to the following net f. o. b.; Stove, $3.25; Chestnut, $3; and Broken and Egg, $2.80. This, of course, caused the utmost demoralization, and did not in the least improve the demand for coal. At the same time, it engendered considerable ill feeling, and may make a final settlement much more difficult.

A week ago, we advised our readers that the time had come to keep a close watch of the coal trade, as strange and unexpected developments were not improbable at any moment. We wrote as we did, because we saw a change of feeling in some quarters, and what appeared to be an unwarranted confidence in the situation.

During the week, there has been partially revealed a big scheme for getting control of Reading to manage it in complete harmony with, if not in the interest of, the Pennsylvania Railroad. Friends of the latter company assert that this syndicate has secured not only a control of the general mortgage bonds, but a control of the stock of the company as well. They also say that their interests are now so great that they can very soon control the receivership of the company and then conduct foreclosure proceedings at their leisure. With the completion of this deal, it is stated that the Pennsylvania Railroad will be ready to join the coal combination, and with that company falling into line, the Delaware, Lackawanna & Western and the Lehigh Valley will promptly follow suit, after which there can be but little if any trouble. There is another side to this whole question, and that is Mr. Gowen. He does not seem much disturbed over the situation, and believes that he will be the controlling spirit in Reading matters. As it is impossible to get at the bottom facts as to the actual doings of the syndicate, it is unwise to venture an opinion on the final outcome of the deal, while it will be equally unwise to disregard entirely the statement made to us and given above.

We are informed that Mr. Gowen will again make an effort to establish a coal pool as proposed by him some years since. We admit that he will meet many obstacles before he can succeed; but even then, it will not be nearly as difficult a matter to accomplish as his work among the Molly Maguires. We think that, if this arrangement could be carried out, it would be a direct saving of many millions of dollars to the coal trade, while in permitting a complete maintenance of prices it would probably add millions more to the profits of the trade.

Prices are as follows per ton f. o. b.:

Stove	$3.25@$3.35
Broken and Egg	2.70@ 2.90
Chestnut	2.90@ 3.10

Bituminous.

Messrs. Berwind, White & Co. have taken the Fitchburg Railroad contract. The Maine Central contract, taken by the Norfolk & Western Company, is said to have been at about $3.10 a ton delivered. The meetings for the purpose of forming a pool to control the entire coal coming to the Northern seaboard have continued during this week without any results at the present writing, although it is expected that an allotment arrangement will be completed at any moment.

Buffalo. Feb. 3

[From our Special Correspondent.]

News items are scarce; the following may be of interest, especially the first in order:

The Committee on Streets of the Common Council reported on Monday in favor of allowing the Natural Gas-Fuel Company to lay pipes in our city. There is no doubt that the majority of the citizens are in favor of the plan. There are many, however, who regard the subject in what they term the business point of view, arguing that the grant should not be recorded, unless with many restrictions, and those drafted are not sufficiently definite and comprehensive. The result of the deliberations of the Council was, by a vote of 19 to 7, that the whole matter be laid on the table and printed, thus giving a week at least for further consultation and consideration. It would be interesting reading to give all the points of the controversy, but your limited space must be considered. Two or three of our coal men are very pronounced in their opposition to the introduction of natural gas for fuel.

The bituminous coal pooling arrangement, which at one time seemed to have been successfully arranged between the producing and carrying companies, has fallen through at present writing. It is reported that another meeting of the representatives is to be held at the end of this week.

One of our local newspapers thus summarizes the Weber canal bill: "It was drawn with the express view of satisfying the peculiar notions of people who are sensitive upon the subject of federal intervention or control. Under the Weber bill, the State surrenders not a tittle of its authority. The improvements will be made by the State and the canal managed and maintained by the State exactly as it is now. No federal official will step foot upon the canal or raise a voice as to what is to be done or how it is to be done, until after the improvements are completed; then the United States government, in view of the national character of the work, will reimburse the State for the outlay."

The whole question is simmered down to this: "Whether the people of the State prefer to pay from $3,000,000 to $5,000,000 for a work of conceded national importance, or have the tax made general and all sections of the country bear a proportion of the expense."

The Consumers' Gas Company has withdrawn the application for permission to lay pipes, etc., in our city.

The Detroit Transportation Company has begun a suit at Milwaukee against Mr. F. Y. Yates, to recover damages for the detention of the propeller Iron Duke and consort at that port last August in unloading their coal cargoes. The boats had been chartered for two

cent corn cargoes from Chicago, and because of the delay were obliged to take one and three quarter cents.

Boston. Feb. 3.

[From our Special Correspondent.]

The market continues very dull and unsatisfactory for anthracite coal, settling down on the nominal basis of $8.50 for Stove f. o. b. at New York, $3 for Broken and Egg, and $3 for Chestnut. Actual buying prices range from these figures to those 10 to 25 cents below. Every thing is unsettled. Coal is piling up, and the combination is a matter of great uncertainty. If coal stocks should go down instead of advancing, we should have a combination more surely. The coal stocks in Wall street run the coal market. This is not only the position of the ENGINEERING AND MINING JOURNAL, as I have often seen it expressed, but I find it to be the view of our coal dealers generally.

Bituminous coal is more active. Not only has the Fitchburg contract for 80,000 tons been placed since our last, but it is believed that the Boston & Albany has bought 100,000 tons or thereabouts. The indications are, that the prices obtained will not exceed those of 1885. The Maine Central is believed to have obtained its 75,000 tons at a low figure. It looks as though shippers were taking great risks on freights. We continue to quote cargo lots at $3.50@$3.70 delivered.

There is a strong feeling in freights and a continued scarcity of vessels. President Winsor, of the Boston Tow-Boat Company, is reported as saying that the company will build a line of barges to run between Boston and New York in the coal trade, if he can get the tug Pearson altered over for that service at reasonable figures. A decision is expected to be reached soon. There appears to be no foundation in any other talk concerning a line of coal barges. If the Tow-Boat Company get into this business, it will build new barges that will be as seaworthy as schooners. The tug will be fitted with a powerful compound engine. Its present boiler-power exceeds that of any tug on the coast. The company claims that it will be able to make the trip in thirty-six hours. President Winsor says they will not be allowed to combat with the Vessel-Owners' Association, and are not to be built for that purpose. However that may be, the addition of such carrying capacity as the barges will afford, particularly if the trip can be made in thirty-six hours, would have its influence in lowering freights.

We quote current rates exclusive of discharging:

New York, $1.15@$1.25; Philadelphia, $1.25@$1.30; Baltimore, $1.25@$1.30; Newport News, $1.20@$1.25; Richmond, $1.25; Cape Breton, $1.60@$1.75; Bay of Fundy, $1.40@$1.50.

Retail trade is quiet. There is no material change in the price or demand for cannel coal this season. Quotations as a whole are unchanged this week.

COAL STOCKS.

NAME OF COMPANY.	Par value of shares.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted so much per share. Jan. 30. H.	Jan. 30. L.	Feb. 1. H.	Feb. 1. L.	Feb. 2. H.	Feb. 2. L.	Feb. 3. H.	Feb. 3. L.	Feb. 4. H.	Feb. 4. L.	Feb. 5. H.	Feb. 5. L.	Sales from Jan. 30th to Feb. 5th, inclusive.
Barclay Coal														
Cameron Coal	50							13⅝	13	13¾	13½	13¾		1,100
Col. C. & I	10			23⅛	23¼	24¾	24	24¼	23¾	24¾	23¾	24½	23¾	4,290
Ches. & O. RR	100			11				11⅛		11	10½			1,205
Consol. Coal	100													
Cumb. C. & L	100													
Del. & H. C	100	91½	89¾	91⅝	90⅜	94⅝	91⅜	95½	93¼	96½	94⅝	96⅜	95¼	63,340
D., L. & W. RR	50	119½	117⅝	121⅞	119⅝	126¼	121⅝	128¼	124¾	131	127⅝	131¾	129	839,075
Elk Lick Coal Co														
Lehigh C. & N.†	50	47⅝	47	47½	47¼	47⅜	47⅝	48	47⅞	48½	48			5,409
Lehigh Valley RR.†	50	56½		57	56¾	57⅛	57	57¾	57½	57½				942
L. & W. C. & I Co														
Maryland Coal	100													
Montauk Coal	100													
Morris & Essex	50			134		135½	135	136						316
New Central Coal	100	11½												100
N. J. C. RR.	100	45⅝	44¾	46¼	45	48⅝	46½	48	47	47¾	45¾	46½	44½	85,780
N. Y. & S. Coal	50													
Penn. Coal	50													
Penn. RR †	50	54	53¾	55¼	54	55	54¾	54¾	54⅝	55⅛	55			20,222
Ph. & R. RR.*	50	22	21⅛	22¾	22	22⅛	21⅛	21⅝	21⅛	21⅛	21	21	18½	37,219
Spring Mountain	50													
Westmoreland Coal†	50													

* Of the sales of this stock, 13,549 were in Philadelphia, and 23,670 in New York.
† The quotations for these stocks are not percentage, but actual price. Total sales, 1,058,892.

FINANCIAL.

Mining Stocks.

NEW YORK, Friday Evening, Feb. 5.

Business in the mining market has been dull. The total transactions amounted to only 46,347 shares, showing a decrease of 11,088 shares, as compared with those of the preceding week.

The prominent feature of the Comstock shares has been Consolidated California & Virginia, which advanced from $1.94@$2.70, in consequence of the announcement of a dividend of $64,800, the first dividend since the consolidation of the California and Consolidated Virginia mining companies. Hale & Norcross has been lower, ranging from $2.75@$2.25. Sutro Tunnel records but a few sales, at from 18@19c. Savage has ruled at $1.25. Sierra Nevada, at 70c. The only business done in the other Nevada stocks was Eureka, at from $2.40@$2.25; and Navajo, at 42c. assessment paid, nd 10c. assessment unpaid.

A little more interest has been shown in the Bodie stocks. Bulwer shows a business of 2200 shares, at from 50@46c. Bodie has been active at from $1.75@$1.65. Mono remains at $4.25@$4. Consolidated Pacific at 30c. Standard, at from $1.15@$1.10. Quicksilver Preferred shows a sale at $22.

The prices of Colorado stocks show no important change, and the dealings generally have been small. Bassick records a few transactions at from 15@12c. Freeland, at from $1.80@$1.75. Plutus, at from $3.10@$3. Colorado Central, at $2.25. Robinson Consolidated, at $1.

Caledonia has been active, with downward prices, ranging from $2.15@$1.95. Father de Smet last month passed its usual monthly dividend, and consequently the price has been lower, at from $3@$2.75. Homestake is firm at from $21.75@$22.

The movements of the Horn-Silver Mining Company are still clouded in darkness; but little business has been done, at from $3.60@$3.50. Alice sold at from $1.75@$1.70. Silver King, at from $6.50@$6.25.

The following securities were sold at auction at Philadelphia on the 3d inst.: $36,500 Shenandoah Iron, Lumber, Mining, and Manufacturing Company; $1000 Lehigh Navigation consolidated mortgage 7s, at 129½; $1225 Reading Railroad scrip, at 24; 40 shares of Reading Railroad, at 10½; 30 shares of Pennsylvania Railroad, at 54⅝; $1000 Lehigh Valley Railroad consolidated mortgage 6s, at 133¾; $6000 Pennsylvania Railroad general mortgage 6s, at 133¾; 72 shares of Penn Gas Coal Company, at 47; $10,500 Chesapeake & Delaware Canal 6s, at 88¼@89; 533 shares of Excelsior Brick and Stone Company, at 2½; $4000 Susquehanna Canal Company 6s, at 15⅛@16.

Coal Stocks.

Under a new "deal," engineered by the Drexel Morgan syndicate, which adjusted West Shore to rehabilitate Reading and accomplish complete harmony among the trunk lines and in the coal trade, the stock market has become quite active, and prices have advanced considerably. From present indications, the deal will be a success, and a fresh impetus will be given to speculation and general trade. Although the coal stocks would be greatly benefited by the contemplated deal, the great advance in them since our last has been largely due to the fact that they were oversold.

The dealings in Lackawanna have aggregated 839,075 shares, at $117⅝@$131¾, closing at 129⅝. The transactions in Delaware & Hudson amounted to 63,340 shares, at $89¾@$96½, closing at $95¼. Jersey Central, with sales of 85,780 shares, at $44¾@$48⅝, closed at $45. Reading sold at $22¾@$18½, and closed at $19¾, with sales of 23,670 shares for the week. It is understood that the new deal in Reading contemplates a big assessment of the stock.

Meetings.

The annual and special meetings of the following companies will be held at the times mentioned:

Chester Pipe and Tube Company, South Chester, Pa., February 10th, at half-past twelve o'clock P.M.

Connellsville Gas Coal Company, No. 333 Walnut street, Philadelphia, Pa., February 22d, at twelve o'clock M.

Consolidated Coal Company, No. 19 German street, Baltimore, Md., February 17th, at twelve o'clock M.

Copper Queen Consolidated Mining Company, Nos. 37 and 39 Wall street, New York City, February 9th, between twelve and one o'clock P.M.

Highland Coal Company, No. 320 Walnut street, Philadelphia, Pa., February 10th, at twelve o'clock P.M.

Locust Mountain Coal and Iron Company, No. 222 South Third street, Philadelphia, Pa., February 23d, at twelve o'clock M.

Moreno Valley Gold Gravel Mining Company, Metropolitan Hotel, New York City, February 9th, at two o'clock P.M.

Robinson Consolidated Mining Company, No. 80 Beaver street, New York City, March 2d, at twelve o'clock M.

Sweetwater Mining Company, Sieghortner's, No. 32 Lafayette Place, New York City, February 13th, at twelve o'clock M.

Dividends.

Chartiers Valley Natural Gas Company, of Pennsylvania, has declared a dividend of ten per cent on the capital stock.

Consolidated California & Virginia Mining Company, of Nevada, has declared a dividend (No. 1) of thirty cents a share, or $64,800, payable at San Francisco.

East Bangor Consolidated Slate Company, of Pennsylvania, has declared a semi-annual dividend (No. 5) of $4 a share, payable on demand.

Manhattan Mining Company, of Nevada, has declared a dividend of twenty-five cents a share, or $12,500.

North Chicago Rolling-Mill Company, of Illinois, has declared a dividend of three per cent on the capital stock.

Philadelphia & Reading Railroad is purchasing, at the rate of five per cent, the interest and coupons due February 1st, of the divisional coal land mortgage bonds of the Reading Coal and Iron Company secured on the McNeal tract.

Silverton Mining Company, of Colorado, has declared a dividend (No. 10).

Westinghouse Air-Brake Company, of Pennsylvania has declared an extra dividend of 30 per cent.

DIVIDENDS PAID BY MINING COMPANIES DURING THE MONTH OF JANUARY AND FROM JANUARY 1ST, 1886.

NAME OF COMPANY.	Location of mines.	Paid during month of January.	Since January 1st, 1886.
Adams, S. L	Colo.	$15,000	
Atlantic, C	Mich.	40,000	
Boston & Montana, G. S.	Mont.	30,000	
Caledonia, G	Dak.	10,000	
Calumet & Hecla, C	Mich.	500,000	
Central, C	Mich.	40,000	
Freeland, G. S. L	Colo.	20,000	
Granite Mt., S	Mont.	60,000	
Hecla Con., G. S. L. C	Mont.	15,000	
Helena Mg. & R., G. S. L. C	Mont.	19,950	
Homestake, G	Dak.	50,000	
Jackson, G. S	Nev.	5,000	
Manhattan, S	Nev.	12,500	
Ontario, S	Utah	75,000	
Plymouth Con., G	Cal.	25,000	
Quincy, C	Mich.	160,000	
Silver King, S	Ariz.	25,000	
Small Hopes Con., S. L	Colo.	50,000	
		$1,152,450	

G., Gold; S., Silver; L., Lead; C., Copper.

Pipe Line Certificates.

Messrs. Watson & Gibson, Petroleum Brokers, No. 49 Broadway, report as follows for the week:

The oil market during the past week has been on the down grade. The lowest price touched was 81½c., and the highest on the recovery was 84c., leaving off to-night at 83c. The causes of the heavy break of 30 cents a barrel in oil within the past three months are, first, the scare as to the developments in the Washington County field, and at Kane in McKean County. The actual production from these two quarters is not large, but oil men are afraid that subsequent work will largely increase their output. The second cause is the generally accepted fact that the Standard Oil Company is opposed to high prices. Speculation is quiet in oil and the majority of members of the Consolidated Exchange are devoting themselves to the railroad stock department.

Thursday, 129,000 shares were traded in, and on Tuesday and Wednesday an ave rage of 100,000. In active stocks and in small lots of from 10 to 50 shares, it is even a better market than the Stock Exchange.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange:

	Opening.	Highest.	Lowest.	Closing.	Sales.
Jan. 30.....	83¼	83½	81½	82⅝	7,290,000
Feb. 1..	82¾	83¼	82¼	82½	4,335,000
2.... ..	82¾	84⅛	82⅜	83¼	5,519,000
3.....	83¼	83⅜	82½	82⅝	3,436,000
4.	82½	83¾	82⅜	82⅞	4,963,000
5.....	83¼	84	83	83	4,517,000
Total sales					30,060,000

San Francisco Mining Stock Quotations.

Daily Range of Prices for the Week.

Name of Company.	Closing Quotations. Jan. 29.	Jan. 30.	Feb. 1.	Feb. 2.	Feb. 3.	Feb. 4.
Albion.....	... ..	.. ..	.... ..	.... .	.....	.... ..
Alpha.....	... ..	... ..	... ..	... ..	... ..	... ..
Alta.....	.... ..	.15	.15	.15	.. ....	.10
Argenta.....	.... ..	.... ..	.....	.....	.....	.....
Bechtel..... .	.... .	.... ..	.....	.....	.....	.... ..
Belcher....	.... ..	.... ..	1.00	1.00	.....	.... ..
Belle Isle.....	.... ..	.... ..	.....	.....	.....	.....
Best & Belcher..	.... ..	.... ..	.60	.80	.70	.75
Bodie.....	.... ..	1.75	1.75	1.62½	1.75	1 50
Bullion	.... ..	.....	.....	.....	.....	...
Bulwer....	.... ..	.50	.45	.45	.....	.....
Chollar.....	.... ..	.... ..	.85	.85	.85	1.00
Con. Pacific.....	.... ..	.... ..	.....	.35	.....	.25
Con. Cal. & Va..	.... ..	2.12½	2.00	2.75	2.75	2.75
Crown Point.. ..	.... ..	.... ..	.... .	.75	....	.80
Day...	.... ..	.... ..	.....	.....	....	.... ..
Elko Cons	.... ..	.... ..	.....	.....	.....	.... ..
Eureka Cons....	.... ..	2.25	.... .	2.25	....	.... ..
Exchequer	.... ..	.... ..	.....	.....	.....	.....
Gould & Curry..	.... ..	.70	.65	.75	.75	.80
Grand Prize .. .	.... ..	.... ..	.....	.....	.....	.....
Hale & Norcross	.... ..	2.37½	2.37½	2.37½	2.50	2.50
Independence...	.... ..	.... ..	.....	.....	.....	.....
Martin White...	.... ..	.... ..	.....	.....	.....	.....
Mexican.....	.... ..	.35	.35	.40	.40	.35
Mono.	.... ..	4.12½	4.00	4.00	3.87½	3.75
Mount Diablo ...	.... ..	.... ..	.... ..	3.00	3.00	3.00
Navajo.....	.... ..	.10	.10	.10	.10	.05
Northern Belle..	... ..	.... ..	.....	.....	.....	.....
North Belle Isle.	.... ..	.... ..	.....	.....	.....	.....
Ophir.	.... ..	.50	.50	.60	.60	.50
Overman.....	.... ..	.... ..	.....	.....	.....	.....
Potosi.....	....	.40	.40	.40	.40	.40
Savage.....	.... ..	.50	.50	.60	.55	1.12½
Scorpion.....	.... ..	.... ..	.....	.....	.....	.....
Sierra Nevada...	.... ..	.35	.35	.40	.40	.40
Silver King.....	.... ..	.... ..	.....	.....	.....	... ..
Tip-Top.....	.... ..	.... ..	.....	.....	.....	.....
Union Cons.....	.... ..	.20	.15	.25	.30	.30
Utah.....	... ..	.... ..	.....	.... .	.50	.75
Wales Cons.... ..	.... ..	.... ..	.....	.....	.....	.....
Yellow Jacket...	.... ..	.... ..	.....	....	.90	.95	.90
....						

Boston Copper and Silver Stocks.

[From our Special Correspondent.]

BOSTON, Feb. 4.

The market for mining stocks has been extremely dull the past week; the aggregate of the sales would hardly be a fair day's work for one broker. While the market is so inactive, prices are firm for good copper stocks, and if a few orders come in to buy stocks, an advance in prices would be sure to follow. There is no speculative demand for low-priced shares, and it is evident that the boom in this class of stocks is not yet in sight. In Calumet & Hecla, 15 shares only were sold at $215@$217, with $216 freely bid for it, and but little offered. Quincy advanced from $47@$50 on sales of 38 shares only, and reacted to $48½ for a five-share lot, which was the bidding price. Franklin also advanced from $10⅛@$10¾, and is wanted at the latter figure; none offered better than $11; sales, 102 shares. The above comprises all the sales in copper stocks for the week at the regular Stock Exchange.

In silver stocks, we note sales of 300 shares Bonanza at $1⅝, 100 shares at $1¾, and 100 at $1½. Catalpa sold at 40c., but is offered at the same price, 37½c. bid. Crescent sold at 17½c. Dunkin, at 30c.

At the Mining Exchange, there has been but little doing. Bowman Silver has lost its boom for the present. The stock sold at 40c. a few weeks since, and was offered to-day at 18c., with no takers. Milford is steady at 53@56c., and is looking well for an advance. In the miscellaneous stocks, water-meters are in better demand, with sales of both New England and Standard at 15@18c.

DIVIDENDS.

PLYMOUTH CONSOLIDATED GOLD MINING COMPANY, 23 NASSAU STREET.
NEW YORK, Jan. 26, 1885.
DIVIDEND NO. 33.
The Board of Trustees have declared a dividend of TWENTY-FIVE THOUSAND DOLLARS, the same being *twenty five cents* per share of the capital stock of the company, payable on the fifth day of February, at the Company's offices in New York and San Francisco.
W. VAN NORDEN, President.

COLORADO CENTRAL CONSOLIDATED MINING COMPANY,
48 EXCHANGE PLACE, Room 26.
Dividend No. 6, of FIVE CENTS per share, has been declared to the stockholders of this company, payable on February 10th, at the Farmers' Loan and Trust Company. Transfer-books close on January 30th, reopening on February 11th. R. V. MARTINSEN, Treasurer.
Jan. 14, 1886.

ATLANTIC MINING COMPANY,
76 WALL STREET, NEW YORK.
DIVIDEND NO. 7,
ONE DOLLAR per share, will be payable January 28th, 1886, to stockholders of record January 16th. Transfer-books will reopen January 28th.
JOHN STANTON, Treasurer.

CENTRAL MINING COMPANY,
76 WALL STREET, NEW YORK.
DIVIDEND NO. 24.
Two DOLLARS per share, will be payable February 1st, 1886, to stockholders of record January 21st.
Transfer-books will reopen February 1st.
JOHN STANTON, Treasurer.

MEETINGS.

THE COLORADO SMELTING COMPANY,
18 WALL STREET,
NEW YORK, JAN. 18, 1886.
The annual meeting of the stockholders of the Colorado Smelting Company will be held at the office of the company, in South Pueblo, Colorado, on Monday, February 8th prox., at noon.
The books will close February 2d and reopen February 9th HENRY C. COOPER, Secretary.

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	9		2.25	5.84	15.84	27.65	37.71	47.17
	12	1	3.00	7.46	20.04	34.70	47.03	60.00
	15		3.66	9.28	24.49	42.42	57.49	73.25
	18	1½	4.33	10.78	28.95	50.14	67.96	86.70
	21		5.00	12 44	33.41	57.86	78.42	100.05
	24	2	5.67	14 10	37.87	65.59	88.89	113.40
	27		6.29	15.58	41.85	72.48	98 23	125.82
	30	2½	6.86	17.07	45.83	79.38	107.56	137.25
¼ Column.	33		7.45	18.55	49.81	86.28	116.93	149.17
	36	3	8.05	20.04	53.80	93.18	126.28	161.10
	39		8.58	21.37	57.38	99.38	134.68	171.82
	42	3½	9.12	22.70	60.97	105.58	143.09	182.55
	45		9.66	24.03	64.56	111.78	151.49	193.27
	48	4	10.20	25.37	68.14	117.99	159.90	204.00
	54	4½	11.17	27.79	74.64	129.27	175.19	223.50
	60	5	12.15	30.23	81.15	140.55	190.48	243.00
⅜ Column.	66	5½	13.05	32.46	87.16	150.96	204.56	261.00
	72	6	13.95	34.70	93.18	161.37	218.69	279.00
	78	6½	14.84	36.81	98.84	171.17	231.97	296.95
	84	7	15.74	38.93	104.50	180.97	245.26	312.90
	90	7½	16.51	40.95	109.93	190.49	258.03	329 25
	96	8	17.28	42.99	115.49	199.87	270.81	345.81
½ Page.....	102	8½	18.09	45.01	120.85	209.28	283.55	361.75
	108	9	18.90	47.03	126.28	218.69	296.29	377.90
	114	9½	19.72	49.07	131.77	228.19	309.19	395.45
	120	10	20.55	51.12	137.26	237.70	322.15	411.00
	126	10½	21.41	53.26	143.02	247.68	335.67	428.25
⅝ Page.....	135	11¼	23.25	55.40	148.75	257.65	349.20	445.50
¾ Page.....	204	17	32.25	79.20	218.00	374.05	503.10	633.50
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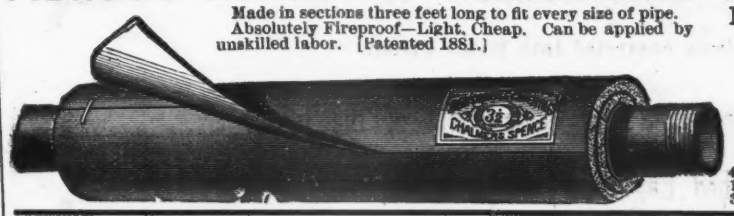
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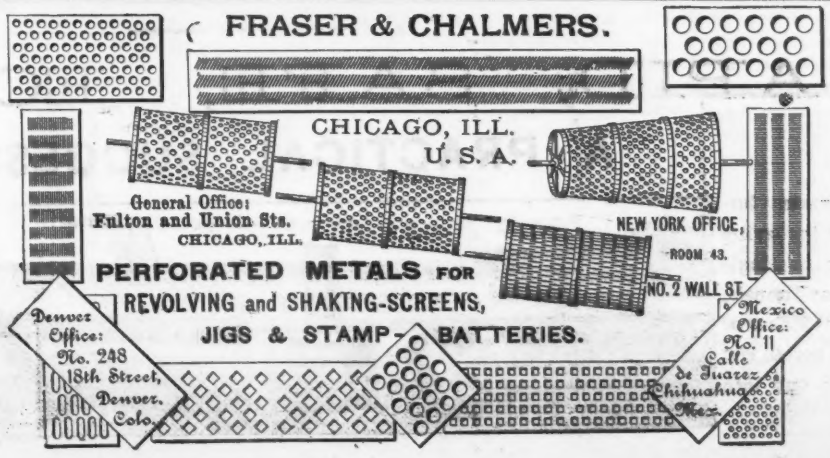
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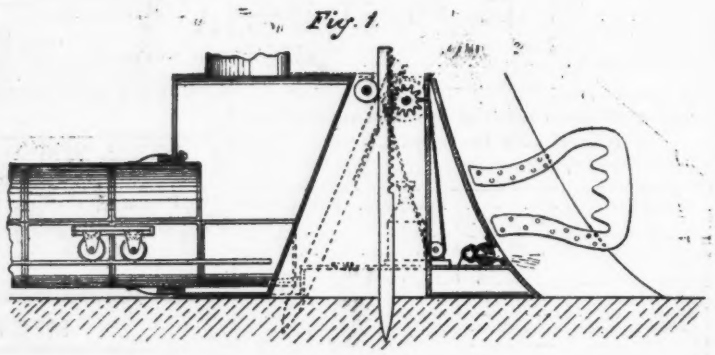


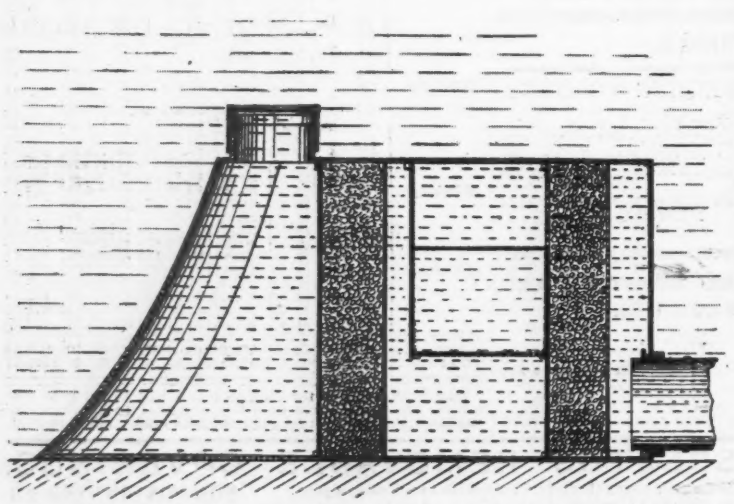
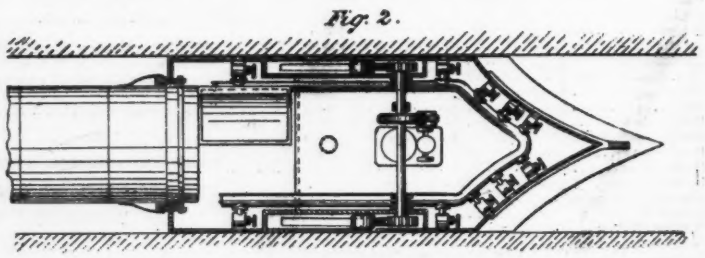
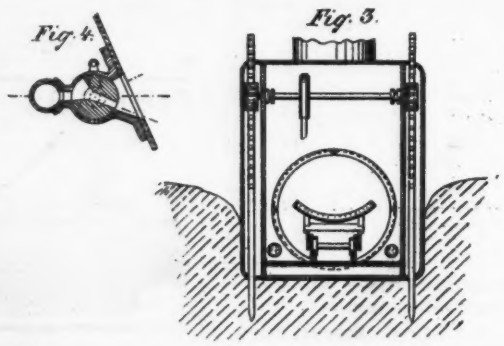


Fig. 5.—Caisson converted into Water Filter.





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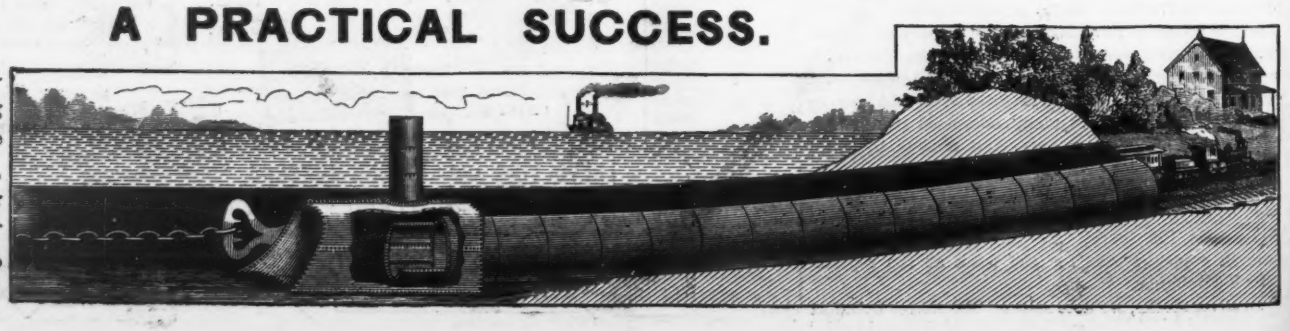
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